CW
MI48106UIVYMUIVYMA FCWWB
UNIVERSITY MICROFILMS INTL
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

IN DEPTH: *Japan's Fifth Generation*

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Framingham, Mass. and additional mailing offices ©1982 by CW Communications/Inc.

py; $36/year June 14, 1982 Vol. XVI, No. 24

NEWSPAPER

CW Photo by S. Blakeney

Elbowroom was at a premium in Houston's Astroarena last week as more than 93,000 people showed up for the National Computer Conference.

Under NCC Big Top, Professionalism Grows

By Tim Scannell
CW Staff

HOUSTON — All the elements were there — the balloons, giveaways, smiling models and a multicolored canopy over the exhibit floor. However, this year's National Computer Conference was more professional than previous shows and stressed more user education.

At least that was the opinion of a number of the more than 93,000 people — a record-breaking crowd — who made the trek to the computer industry's mecca last week, some of them experiencing their first NCC and others toughened old hands.

Herb Blacker, a vice-president of operations for Applied Intelligence of Dallas Corp., was disappointed with the general layout of the exhibits, which he thought was confusing and tiring. Instead of the usual straight-aisle format, the American Federation of Information Processing Societies, Inc. this year chose to arrange vendors and displays on a giant carpeted "wagon wheel" that turned into a maze as the crowds filled the floor.

But Blacker, who has been attending the annual show since 1968, came to learn about the latest in microtechnology for his health-related computer business. And that is exactly what he did in a huge way, since the microcomputer exhibits and introductions overshadowed the traditionally mainframe-oriented show.

Last week's NCC was a first for Merritt Funk, a young design engineer for Mostek Technology. Thoroughly exhausted after his second day on the show floor, Funk admitted that a person looking for a small business system or microcomputer might be confused by the number of offerings on the floor. But most vendors seemed to take the time to educate the masses rather than trying to promote the bells and whistles of a particular system.

Lyell Jennings, director of office information processing for Mead Office Systems in Richardson, Texas, thought that anyone heavily involved in the DP industry — the operations directors and supervisors — might not walk away from this year's show with any new knowledge. However, the show was an ideal place for an administration-weary manager to catch up on the latest in technology, he claimed.

There was a lot that was predictable about this year's show. For instance, microcomputers came up from the basement in last year's show and received a great deal of attention at last week's event. There were no major introductions at the show, most vendors preferring to unveil their electronic wonders a few weeks or months prior to the gathering.

If anything, most people who elect-

(Continued on Page 2)

Users Warned of Hurdles In Road to Automated Office

By Bruce Hoard
CW Staff

HOUSTON — "You are sitting in the middle of something that is no longer a smooth evolution," Amy Wohl told National Computer Conference attendees last week at an overview session titled "The State of Office Automation."

The president of Advanced Office Concepts, Inc. discussed five "hot" office automation areas including management/professional workstations, personal computers, local-area networks, vendor selection strategies and compatibility.

In the realm of management/professional workstations, Wohl said, users are looking for "friendly interfaces," but she cautioned them against systems featuring menus that are too integrated. She cited touch screens as a boon to executives who do not like to type, but noted they are not right for people who interact with their systems heavily.

"Tailored interfaces" allow users to place infrequently used functions in an optional category, she said. They are currently available on systems that are vendor programmed, but not on those systems that require user programming.

(Continued on Page 6)

Standard Likely For Data Base? Panel in Doubt

By Tom Henkel
CW Staff

HOUSTON — Users waiting for a definitive data base standard can expect to wait a while, according to panelists here at last week's National Computer Conference.

A panel of data base researchers representing the American National Standards Institute and Codasyl evaluation boards consistently spoke in terms of "if" standards will be developed as opposed to "when" users might see them.

At this point, Ansi has determined that the goal it has been working on for the past 10 years — a single data base standard — is all wrong. Instead, Ansi has decided to develop a series of data base models, somewhere in the neighborhood of two to five, which will identify standardized data base software for a variety of applications, according to Dr. Terry Hardgraves of the National Bu-

(Continued on Page 2)

Point Four Minis Get Top Rating

By Tim Scannell
CW Staff

DELRAN, N.J. — Minicomputers from Point Four Data Corp. were rated tops, followed by machines from Hewlett-Packard Co. and Tandem Computers, Inc., in Datapro Research Corp.'s annual user survey of computer systems.

A total of 2,753 users, representing 3,350 computers, participated in the survey of minicomputers and small business systems.

The nearly 300 users of the top three systems scored their computers higher in terms of overall satisfaction than did users of machines from such companies as Wang Laboratories, Inc., IBM and Digital Equipment Corp. While only eight Point Four users participated in the survey, they also reported the smallest number of problems with their systems and were the only ones that unequivocally recommended them to other users, according to Datapro.

Other key findings of the survey:

- Machines from Microdata Corp. came in fourth, while those from Wang and Prime Computer, Inc. tied for fifth place.
- IBM and DEC — with a total of 1,504 respondents and more than 1,700 systems represented — had the largest number of users in the survey, but they finished sixth and seventh, respectively. Texas Instruments, Inc. came in eighth.

(Continued on Page 60)

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

TM reg. U.S. Pat. Off.

Editor John C. Whitmarsh
Managing Editor Rita Shoor
News Editor Cheryl M. Gelb
Senior Editors:
Features Catherine Marenghi
Software Lois Paul
Communications Phil Hirsch
Systems Timothy J. Scannell
Office Automation Bruce Hoard
Industry Marcia Blumenthal
Management Brad Schultz
Writer/Analysts: Marguerite Zientara, Tom Henkel
Staff Writers: Jim Bartimo, Susan Blakeney
Correspondents:
New York Bob Johnson
Washington, D.C. Jake Kirchner, Phil Hirsch
West Coast Robert Batt, Jeffry Beeler
Chief Copy Editor Donovan White
Copy Editors: Dave Bouffard, George Cohen, Kathie Gow, Patricia Keefe, Steve Milmore, Betsy Morse, Deborah Scaduto, Barbara T. VanScoyoc
Editorial Assistants: Nancy Pinks, June Fettig
Contributors:
Education J. Daniel Couger
Taylor Reports Alan Taylor
Human Connection Jack Stone

SPECIAL PUBLICATIONS
Computerworld Extra!
Editor Jack B. Rochester
Computerworld OA
Editor Ann Dooley
Copy Editor Nancy Fleming

Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES:
New York City: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Telephone: (212) 570-2135.
West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301. Phone: (415) 328-8064.
Washington, D.C.: 880 National Press Building, 529 14th St. N.W., Washington, D.C. 20045. Phone: (202) 347-6718.
England: Richard Hease, ECC Publications, 30-31 Islington Green, London N1. Phone: (01) 359-7481.
W. Germany: Eckhard Utpadel, CW Publikationens, Friedrichstrasse 31, 8000 Munich 40. Phone: (089) 34-90-61. Telex: 5215350.
France: Patrick Morel, Le Monde Informatique, 42, Avenue Montaigne, 75008 Paris. Phone: 720.85.66.
Asia: Mr. Shohei Kurita, Computerworld Japan, 1-19-7 Shintomi, Chuo-ku, Tokyo 104. Phone: (03) 551-3882, Telex: 252-4217.
Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: SECCO AA25468.
Brazil: Eric Hippeau, Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130838(WORD BR).
Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-4218, (905) 514-6309.
Spain: Neil Kelley, Computerworld/Espana, Barquillo, 38, Madrid-4.
Denmark: Helle Lind Christensen, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone: 01-1234-11.

Second-class postage paid at Framingham, Mass., and additional mailing offices PN127420. *Computerworld* (ISSN-0010-4841) is published weekly, except: March (7 issues), June (5 issues), September (6 issues), October (5 issues), December (4 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/ Inc., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Copyright 1982 by CW Communications/Inc. All rights reserved.

PHOTOCOPY RIGHTS: permission to photocopy for internal or personal; use or the internal or personal use of specific clients is granted by CW Communications for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, MA 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol. ‡

Special requests should be addressed to Nancy M. Shannon, CW Communications/Inc. Box 880, 375 Cochituate Rd., Framingham, MA 01701. **ISSN 0010-4841/81 $3.00 + $.50**

$1.25 a copy: U.S. — $36 a year; Canada, Central & So. America — $110 a year; Europe — $165 a year; other foreign — $265 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

Computerworld can be purchased on 35 mm microform through University Microfilm int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

ABC BPA ABP MCC MEDIA DATA POOL

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Dept., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Data Base Standard Put on Hold?

(Continued from Page 1)

reau of Standards' Data Base Study Group.

Calling data base standards research "the most explosive part of computing," Hardgrave said a precise definition of a data base must be developed to meet the growing demand for data base standardization.

In addition, new challenges to that standard must be scrutinized carefully to determine whether new data base technologies actually qualify for inclusion as a standard.

At Ansi, the bulk of that evaluation falls upon the institute's X3H2 Committee. X3H2 member Dr. Don Deutsch, manager of advanced data base products at General Electric Information Services Co., said his committee came close to agreeing on a standard in March 1981, but the standard fell short of obtaining an approving vote.

The problem with the proposed standard centered around a lack of a universal data definition language. Some committee members felt the standard would not succeed if the data definition language was "in a vacuum," Deutsch said.

In the past year, the X3H2 Committee has been trying to regroup to develop a standard, Deutsch said.

Recently, however, the X3H2 Committee had its work load virtually doubled. Ansi decided to extend the scope of the X3H2 Committee to include the relational approach in addition to the structured approach it has evaluated in the past.

In spite of its added work load, Codasyl's Eric Clements, an impromptu speaker at the session, applauded X3H2's work as having made great a contribution to streamlining the standards development and evaluation process.

"They're cleaning up our mess," Clements said, noting that information used to have to pass through eight or nine different committees for approval.

But even with the streamlined committee efforts, neither Hardgraves nor Deutsch appeared confident that users would obtain a workable standard in the near future.

NCC: Professionalism Grows

(Continued from Page 1)

ed to put up with the crowds, the Houston heat, the shuttle buses and overbooked hotels left with an education.

The conferences at NCC — which dealt with everything from software engineering and the institutionalization of Fortran to personal computers — were well attended, according to an Afips spokesman. In fact, more so than last year's show.

Many of those attending chose to devote three hours out of their cramped schedules to attend one of several Professional Development Seminars that were held off-site from the Astrodomain complex, where the show was centered. Afips would have had an even larger attendance at these extended lectures, but they were limited by space. Only about 100 people could fit into the rooms reserved at the Shamrock Hilton, a nearby hotel, and many who registered late had to be turned away, an Afips spokesman said. The organization hopes to rectify the situation by acquiring larger quarters for next year's show in Anaheim, Calif.

Many of the vendors veered from their usual test-drive campaigns and offered "mini-seminars" that were scheduled at various times throughout the day. For the first time, IBM reserved a portion of its massive booth to educate attendees on the latest in general technology. Through displays and well-rehearsed speakers, the firm unfolded details on such things as the Josephson junction, thermal conduction and high-density chips. Digital Equipment Corp. added to the educational spirit by distributing free paperback books that offered a general overview of personal computing.

Many other vendor representatives sported buttons that proclaimed "Ask Me About Ada" or simply "Ask Me," inviting questions and general queries that a few years back might have taken second place to a practiced product spiel.

This Week

IN DEPTH

Interview With Yoneji Masuda .....Follows Page 82
What to Expect From the 5th Generation ID/13

NEWS

Microcomputers Leave Back Seat for Center Stage ..4
Few Vendors Reveal New Mainframe Software 6
Z80-Based Micros Most Notable OA Products 7
How Do Women Moving Into Management Fare? 8
Firms Unveil On-Line Products, Net Updates 9
Don't Be 'Machine-Minded,' Exec Warns 10
NCC '82: A Photo Feature 11
Checklist Outlines Procedure for Selecting DBMS ...12
Professional Attitude Said Key to Success in DP 13
Old Laws Affect New DP Industry: Attorney 14
How Are You Weathering the Recession? 15
OA Planners Urged to Cut Organizational Costs 16
Olson Blasts H.R. 5158 as Anti-Competitive 17
Foreign Visitors' Concerns Hit Close to Home 19
ERA or Not, Tough Role Seen for Women in DP 20
'We Have a Long Way to Go': AWC Keynoter 21
Automatic Conversion of Data Bases Advocated ...23
DSS Use in Government Said a Tough Challenge ...24
You Can't Prevent a Tap: Experts 26
Panelists 'Debate' Censorship of Cryptology 27
CMU Goal: Applying AI to Management Tasks 29
Small Systems Users Rank Reliability Tops 31
Study to Probe Ethics in Applying DP Models 32
Nuclear Disposal Study Breeds Controversy 33
Newsletter Out on System/38 34
Discount Brokerage Firm Takes Stock in DBMS 35
Mail Bomb Case Still Unsolved by Post Office 38
Employee Benefits Division Profits From DBMS 40
Information Service for Elections to Start 44
Off the Press 46
Effective Language Interface Focus of Test 49
NYU Scientists Sift Results in Language Study 50
Managers on the Move 52
Wang, Burroughs Strong in Multiuser Tests 55
Edmonton System Sparks Interest From Others 57
Mini Users Stay With Present Units — Survey 60

EDITORIAL

Editorial: Greatest Show on Earth? 66
Reader Commentary: Ten Pitfalls of Management ...67
Human Connection: 'House' Set in Order 67

SOFTWARE & SERVICES

Prototyping May Alleviate DP Crunch 71
Operating System Designed for Engineering Jobs ...73
Word Processor Runs on PDP-11s 74
Cobol-Based Packages Available for Maintenance ..75
Programs Converted to Run on Nova Compatibles ..76
Editor Runs on Terminals Using HP 3000 78

COMMUNICATIONS

Consulting Firm Makes Right Connection 83
RJE Workstation Programs Fit MV8000, MV6000 ..86
Aid Links DEC Users to Input Ports of Remotes 88

SYSTEMS & PERIPHERALS

Emulex Storage Adapters Link Tape, Disk on VAX ..89
Stand-Alone CAD/CAM System Ties to VAX 90
Graphics Series Incorporates Bell's Unix, C 93

MINIWORLD

Firms Offer 16-Bit Dual-Processor Systems 97
Supermicro 8, 32 Get 16-Bit Processing 100

OFFICE AUTOMATION

Report: Copier Sales Key to Profits at Xerox 103
Structured Systems Bows OA-Oriented Products ..104

COMPUTER INDUSTRY

U.S., Canadian Firms Form DP Coalition 107
Supplier, Two Execs Charged With Conspiracy ...107
Firm Opts for General Ledger System's Flexibility ..108
Information Firms Told to Educate Governments ...110
U.S. Slant on High-Tech Trade Seen Gaining 112
Intel's IAPX 186 Integrates 16-Bit CPU 115
Directory Lists DP Purchasers 118
Computer Associates to Acquire Capex Corp. 119

ADVERTISING INDEX

.....152

MUSKETEERS

Athos, Porthos and Aramis? Nope, SyncSort OS, DOS and CMS!

Call (201) 568-9700.

Meet the Royal Family of Sorting.

Move over Alexandre Dumas! We've got Three Musketeers of our own. And they've developed quite a reputation for slashing CPU Time, and seducing programmers and managers.

Just in case you haven't met this threesome, here are their biographies taken from the "Most Wanted" list of sort programs:

- **SyncSort OS – Founder of the clan. First made his appearance in 1971 and quickly established a reputation for being an unbeatable sortsman. Is now the sorting choice of 73% of America's major data processors, and a Legend in His Own Time.**

- **SyncSort DOS – A chip off the old block. When he bounded onto the scene in 1978, he soon established a reputation as a "Touch of Class in DOS Sorting." Is particularly attractive to young 4300 computers with Fixed Block Architecture and VSAM type data.**

- **SyncSort CMS – Youngest member of the family, but growing more rapidly than either of his brothers at a similar age. Already has over 250 users. Hailed by critics as the first high-performance sort for CMS. Has developed a new technique for slashing TTime.**

What can our Three Sorts of Fortune do for you? Well, they can give you…

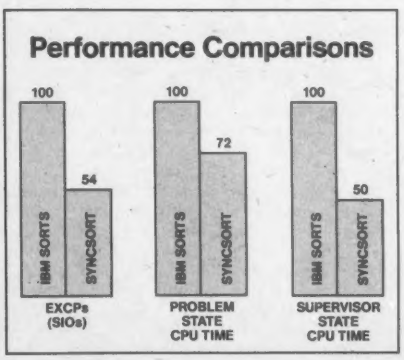
- **SHARPER SORT PERFORMANCE.** If you set up a duel between any SyncSort and any IBM sort, you'll soon discover that SyncSort does a lot more sorting for a lot fewer computer resources. On average, SyncSort will save you anywhere from 15% to 50% in CPU Time, Elapsed Time and SIOs—or TTime if you happen to be a CMS user.

- **HAPPIER PROGRAMMERS.** You can often reduce the amount of time required for simple reports from five programmer days to one programmer day simply by using SyncSort's extended features. They can:
  - select relevant records;
  - perform summaries on designated numeric fields;
  - reformat records on output;
  - insert character strings;
  - convert numeric data to printable characters (including editing);
  - produce reports divided into logical pages with headings, pagination and dating.

- **FASTER SERVICE.** We pride ourselves on our chivalry and courtesy to users. About 85% of all requests for assistance are resolved within 24 hours.

If you need help give us a call and we'll send over one… two… or all three of our Musketeers.

To rescue your sorts from a fate worse than death!



syncsort INC.

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

CW Photos by S. Blakeney

Steelcase tried the silent sell.

Hardware Deep in the Heart of Texas

Microcomputers Leave Back Seat for Center Stage

By Tim Scannell
CW Staff

HOUSTON — A few years ago, microcomputers and small business systems occupied the back seat of the National Computer Conference. This year, however, they were definitely the driving force on the exciting, but at times confusing, exhibit floor.

As in past shows, last week's event had its share of new introductions and unveilings. But most were aimed at the small business microcomputer user. Even the traditionally large-system vendors debuted products that appealed to the lower end of the user spectrum, rather than just the "big machine" people.

CW At NCC

For example, taking a lesson from Digital Equipment Corp. — which a few months ago upgraded its VT-100 terminal with an add-in microcomputer — Harris Corp. introduced a microcomputing option for its recently unveiled Mind Series of distributed data processing computers. The option consists of two 8-in. 1M-byte diskette drives and Digital Research, Inc.'s CP/M and allows users to utilize Harris terminals as personal computers — completely independent of the Mind system.

The upgrade costs $3,100 and will be available in December. Harris is at 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33310.

Cromemco took the wraps off an under-$1,000 personal computer that features 64K bytes of random-access memory (RAM), a 12-in. CRT screen and up to 390K bytes of disk storage. The C-10 system can do word processing or financial analysis. It will be available this fall. Cromemco is at 280 Bernardo Ave., Mountain View, Calif. 94043.

Lobo Drives International of Goleta, Calif., also introduced an inexpensive microcomputer — the Max-80, which has 64K bytes of RAM, a keyboard and ports to handle the firm's CRT monitor and disk drives. The basic unit costs $800 and the CRT terminal is priced at $150.

The firm also debuted an 8-in. floppy disk drive for the IBM Personal Computer, priced at $1,625. Lobo is located at 358 S. Fairview Ave., Goleta, Calif. 93117.

Other systems introduced include a Systems Group small business computer that generates user application software from user prompts and a portable Z80A-based system from Jonos Ltd.

Systems Group's computer, called Business Express, reportedly bypasses the use of high-level languages such as Basic and has a proprietary software/hardware design that is said to allow users to easily generate their own business applications software. The multiuser system, with 25K bytes of memory, costs from $12,000 to $18,000. The firm is located at 1601 Orangewood Ave., Orange, Calif. 92668.

Jonos Ltd.'s Courier computer weighs less than 20 pounds and has a 9-in. CRT screen and a full-editing terminal with 92 keys. The unit is one of the first to use Sony Corp.'s 3½-in. high-density minifloppy disk drives, offering a minimum of storage capacity of 644K bytes. The comptuer costs $3,995 with the CP/M operating system. An attachable printer option costs $595. Jonos Ltd. is at 920-C E. Orange Thorpe, Anaheim, Calif. 92801.

Onyx Systems, Inc. also debuted a small computer, a multiuser version of its Sundance model. The Sundance II has up to 256K bytes of memory, an integral Winchester disk drive, a 12M-byte tape backup, detachable keyboard and green-phosphor CRT terminal. The system is available as a single-user system for $8,550, but can be upgraded to handle three users. The three-user version costs about $10,000. Onyx is at 25 E. Trimble Road, San Jose, Calif. 95131.

Finally, Morrow Designs, Inc. added to the $1,000 micro fray by unveiling a Z80-based system that has a 200K-byte disk storage capability. The system costs $1,195. Morrow is headquartered at 5221 Central Ave., Richmond, Calif. 94804.

Peripherals Make Strong Showing at NCC

By Tim Scannell
CW Staff

HOUSTON — Although the temperature outside the well-cooled Astrodomain complex — where the National Computer Conference was held — flirted with the 100-degree mark, there was a blizzard of peripherals introductions at the show.

Printronix, Inc., based in Irvine, Calif., unveiled an intelligent graphics processor that reportedly can perform such functions as forms generation, bar coding and reverse-image printing. It costs $1,095 and is scheduled for delivery in September. Printronix is at 17500 Cartwright Road, P.O. Box 19559, Irvine, Calif. 92713.

Other introductions include:

• Cartridge tape drives and printers from North Atlantic Industries, Inc.'s Qantex Division. The Models 450 and 451 high-density tape drives are bidirectional and both have storage capacities up to 17.3M bytes. They each cost $1,835. North Atlantic Industries is located at 60 Plant Ave., Hauppauge, N.Y. 11788.

• A desktop, punched-tape reader from Remex, a division of Ex-Cell-O Corp., that responds to Ascii control characters for remote control and has a 300 char./sec transmission rate. The RRJ 7156 is priced at $875. Ex-Cell-O is at 1733 E. Alton Ave., Irvine, Calif. 92714.

• A series of color terminals and a color printer from Envision Corp., based in San Jose, Calif. The Models 210, 220 and 230 terminals have integral 16-bit microprocessors and up to 128K bytes of program memory. They cost $3,450, $4,950 and $6,950, respectively.

The Model 420 color printer offers full graphics and letter-quality printing. It is also controlled by a 16-bit micro and has a 128K-byte memory buffer. The unit costs $3,950. Envision is at 631 River Oaks Pkwy., San Jose, Calif. 95135.

Getting down to the lower end of the peripherals spectrum, Quadram Corp. of Norcross, Ga., debuted a 128K-byte intelligent printer controller/buffer that can accept the printer output of from one to eight computers. Called the Interfazer, the unit costs $295 for the base unit and $295 for each 64K bytes of memory. More information is available from Quadram at 4357 Park Drive, Norcross, Ga. 30093

Micro Technology, Inc. unveiled a mini-Winchester controller for Digital Equipment Corp. RL01 and RL02 disk drives. The device allows a storage capacity of up to 41.6M bytes and costs $1,895. The firm is located at Suite 714, 3605 W. MacArthur Blvd., Santa Ana, Calif. 92704.

And Intersil Systems, Inc. unwrapped a 32K-byte Q-bus-compatible memory card that is compatible with DEC's LSI-11/23 processor. Intersil is at 1275 Hammerwood Ave., Sunnyvale, Calif. 94086.

'Stuffers' Find Slim Pickings

By Bob Johnson
CW New York Bureau

There were slim pickings in terms of new or unusual giveaway items for National Computer Conference attendees this year.

Whether it is the effect the recession is having on a company's ability to spend or the fact that the worth of items such as keychains with company logos is questionable, NCC exhibitors and attendees agreed this year's show did not offer much for the DP "bag stuffer."

Mark Kaufman, an attendee from Gateway Electronics in Houston, said the free items normally given away are here at NCC, but there is "nothing new."

"I haven't seen many novelty things that I would like to pick up. There is plenty of company information and brochures, but that's to be expected," he continued.

While there were few exotic gifts, some firms' offerings drew extra interest from the NCC attendees. Issco Graphics, Inc., gave away a full-color poster produced via computer graphics. Peter Preuss, president of Issco, said he likes the idea of giving away computer graphics posters because they show a combination of the computer's ability and "beauty."

Another company that supplied a popular freebie was Wolfe Computers Aptitude Testing Co. Stephen Berke, a company vice-president, said giving NCC attendees a vinyl briefcase was a way in which to foster the feeling of professionalism that the company hopes to offer. "Our company deals with the cerebral part of the computer industry by offering aptitude testing. Our gift helps us get the message across," he pointed out.

Berke added that the recession may be a primary cause for the lack of substantial gifts at this year's show. "Companies feel that the gifts normally given, like keychains, are not necessarily attracting the caliber of people they are looking for."

The show's most rare and valuable gifts had to be won. Contests and drawings were the "bag stuffer's" best bet.

Thirty guaranteed return investments.

STRUCTURED DESIGN FOR REAL TIME SYSTEMS
CHICAGO AUG. 23-27
ANAHEIM SEPT. 20-24

STRUCTURED DESIGN & PROGRAMMING WORKSHOP
NEW YORK JULY 12-16
LITTLE ROCK JULY 19-23
KANSAS CITY JULY 26-30
DALLAS JULY 26-30
CALGARY JULY 26-30
PORTLAND AUG. 9-13
WASHINGTON, DC AUG. 16-20
LOS ANGELES AUG. 23-27
CHICAGO AUG. 23-27
SALT LAKE CITY SEPT. 13-17
OTTAWA SEPT. 13-17
SEATTLE SEPT. 20-24
BOSTON SEPT. 20-24
MADISON SEPT. 27-01

STRUCTURED PROGRAMMING WORKSHOP
BOSTON JULY 26-30
HOUSTON AUG. 9-13
SACRAMENTO AUG. 16-20
WINNIPEG SEPT. 13-17
LONDON SEPT. 20-24

STRUCTURED PROGRAMMING WORKSHOP IN COBOL
CHICAGO JULY 12-16
WASHINGTON, DC AUG. 9-13
NEW YORK SEPT. 27-01

STRUCTURED PROGRAMMING WORKSHOP IN PASCAL
HOUSTON AUG. 23-27

ADA SOFTWARE ENGINEERING WORKSHOP
LOS ANGELES JULY 12-16
NEW YORK JULY 26-30
ANAHEIM AUG. 16-20
WASHINGTON, DC SEPT. 20-24

STRUCTURED ANALYSIS FOR MICROPROCESSORS
CHICAGO JULY 26-30
HOUSTON AUG. 16-20
SUNNYVALE SEPT. 20-24

STRUCTURED DESIGN & PROGRAMMING WKSHOP. FOR MICROPROCESSORS
ANAHEIM SEPT. 20-24

STRUCTURED PROGRAMMING IN COBOL
NEW YORK AUG. 23-24

QUALITY ASSESSMENT OF ANALYSIS AND DESIGN DOCUMENTS
DALLAS JULY 8-9
LOS ANGELES JULY 15-16
NEW YORK JULY 22-23
SAN FRANCISCO AUG. 12-13
TULSA AUG. 26-27
BOSTON SEPT. 9-10
TORONTO SEPT. 16-17
BALTIMORE SEPT. 27-28

INFORMATION MODELING WORKSHOP
NEW YORK JULY 26-30
LONDON AUG. 9-13
BALTIMORE AUG. 16-20
TORONTO AUG. 23-27
BOSTON SEPT. 13-17
ANAHEIM SEPT. 20-24
DALLAS SEPT. 20-24
SAN FRANCISCO SEPT. 27-01

DATABASE ADMINISTRATORS WORKSHOP
NEW YORK JULY 12-16
HOUSTON AUG. 2-6
ANAHEIM SEPT. 13-17

INTERNAL CONTROLS AND DATA SECURITY WORKSHOP
TORONTO JULY 14-16
CHICAGO JULY 28-30
SAN FRANCISCO AUG. 18-20
OTTAWA AUG. 25-27
NEW YORK SEPT. 8-10
LOS ANGELES SEPT. 22-24

AUDITING STRUCTURED ANALYSIS AND DESIGN WORKSHOP
NEW YORK JULY 19-23
CHICAGO SEPT. 20-24

PROJECT AND TEAM MANAGEMENT WORKSHOP
WASHINGTON, DC JULY 14-16
TORONTO JULY 28-30
HARTFORD AUG. 11-13
ATLANTA AUG. 25-27
CALGARY SEPT. 8-10
NEW YORK SEPT. 22-24

MGT. IMPLICATIONS OF STRUCTURED TECHNIQUES FOR MICROPROCESSORS
SUNNYVALE JULY 8-9
ROCHESTER SEPT. 2-3

KNOWLEDGE BASED SYSTEMS: MANAGEMENT PERSPECTIVE
SUNNYVALE JULY 9
PHOENIX JULY 26
CHICAGO AUG. 20
TORONTO AUG. 23
ANAHEIM SEPT. 10
NEW YORK SEPT. 17

FUTURE TRENDS IN SOFTWARE DEVELOPMENT
NEW YORK SEPT. 22

INTERVIEWING SKILLS WORKSHOP
LOS ANGELES JULY 15-16
CHICAGO JULY 29-30
SAN FRANCISCO AUG. 19-20
BOSTON AUG. 26-27
MEXICO CITY SEPT. 9-10
NEW YORK SEPT. 23-24

STRATEGIES FOR SOFTWARE DEVELOPMENT
ATLANTIC CITY JULY 14-16
TORONTO JULY 19-21

INTRODUCTION TO THE TOOLS OF STRUCTURED DESIGN
NEW YORK AUG. 30-31

STRUCTURED DESIGN WORKSHOP
PITTSBURGH JULY 12-16
OTTAWA JULY 12-16
MILWAUKEE JULY 12-16
TORONTO JULY 26-30
DENVER JULY 26-30
SALT LAKE CITY JULY 26-30
CALGARY AUG. 2-6
HOUSTON AUG. 9-13
SAN DIEGO AUG. 9-13
SEATTLE AUG. 16-20
SAN FRANCISCO AUG. 16-20
NEW YORK AUG. 23-27
HALIFAX AUG. 23-27
SALT LAKE CITY AUG. 26-30
BOSTON SEPT. 13-17
WINNIPEG SEPT. 13-17
PORTLAND SEPT. 13-17
LOS ANGELES SEPT. 20-24
CHICAGO SEPT. 20-24
OKLAHOMA CITY SEPT. 20-24
LONDON SEPT. 20-24

STRUCTURED SYSTEMS DEVELOPMENT
OKLAHOMA CITY JULY 7
STAMFORD JULY 8
ANAHEIM JULY 9
SEATTLE AUG. 2
BOSTON AUG. 4
JACKSONVILLE AUG. 6
MINNEAPOLIS SEPT. 2
WASHINGTON, DC SEPT. 10
COPENHAGEN SEPT. 10

MANAGING STRUCTURED PROJECTS
SAN DIEGO JULY 8-9
SEATTLE JULY 12-13
MEXICO CITY JULY 15-16
OTTAWA JULY 19-20
WASHINGTON, DC JULY 29-30
LOS ANGELES AUG. 5-6
NEW YORK AUG. 19-20
RALEIGH AUG. 26-27
SALT LAKE CITY AUG. 19-20
TORONTO SEPT. 9-10
SAN FRANCISCO SEPT. 16-17
PHOENIX SEPT. 20-21
CHICAGO SEPT. 27-28
BOSTON SEPT. 23-24

STRUCTURED ANALYSIS & SYSTEM SPECIFICATION WORKSHOP
ANAHEIM JULY 12-16
BOSTON JULY 12-16
ATLANTA JULY 19-23
DENVER JULY 19-23
MILWAUKEE JULY 19-23
AMSTERDAM JULY 19-23
OKLAHOMA CITY JULY 26-30
SAN FRANCISCO JULY 26-30
PHOENIX JULY 26-30
SAN JUAN AUG. 2-6
CHICAGO AUG. 2-6
SEATTLE AUG. 2-6
MEXICO CITY AUG. 16-20
EDMONTON AUG. 16-20
WASHINGTON, DC AUG. 23-27
MELBOURNE AUG. 23-27
TORONTO AUG. 23-27
PORTLAND SEPT. 13-17
NEW YORK SEPT. 13-17
HALIFAX SEPT. 13-17
SAN DIEGO SEPT. 20-24
HOUSTON SEPT. 20-24
LOUISVILLE SEPT. 20-24
CALGARY SEPT. 27-01
OTTAWA SEPT. 27-01
INDIANAPOLIS SEPT. 27-01

STRUCTURED ANALYSIS & DESIGN WORKSHOP
COPENHAGEN JULY 12-16
WASHINGTON, DC JULY 12-16
OTTAWA JULY 12-16
SAN FRANCISCO JULY 19-23
HOUSTON JULY 19-23
CALGARY JULY 26-30
CHICAGO JULY 26-30
BOSTON AUG. 2-6
TORONTO AUG. 2-6
LOS ANGELES AUG. 9-13
WINNIPEG AUG. 16-20
SAN ANTONIO AUG. 16-20
MINNEAPOLIS AUG. 16-20
TULSA AUG. 23-27
DENVER SEPT. 13-17
MONTREAL SEPT. 13-17
NEW YORK SEPT. 20-24
ATLANTA SEPT. 20-24
HALIFAX SEPT. 20-24
PHOENIX SEPT. 27-01
CHATTANOOGA SEPT. 27-01
JACKSONVILLE SEPT. 27-01

STRUCTURED ANALYSIS FOR REAL TIME SYSTEMS
CHICAGO JULY 19-23
ANAHEIM JULY 26-30
WASHINGTON, DC AUG. 23-27
SAN MATEO AUG. 23-27
HOUSTON SEPT. 13-17
NEW YORK SEPT. 20-24
TORONTO SEPT. 27-01

STRUCTURED ANALYSIS FOR USERS
NEW YORK JULY 14-16
CHICAGO AUG. 18-20
SAN FRANCISCO SEPT. 15-17
TORONTO SEPT. 22-24

ADVANCED STRUCTURED ANALYSIS
NEW YORK JULY 12-16
OTTAWA JULY 19-23
MONTREAL JULY 26-30
BALTIMORE AUG. 2-6
HOUSTON AUG. 16-20
CHICAGO AUG. 23-27
LONDON SEPT. 6-10
TORONTO SEPT. 13-17
ANAHEIM SEPT. 27-01
DALLAS SEPT. 20-24
SAN FRANCISCO SEPT. 20-24

INTRODUCTION TO THE TOOLS OF STRUCTURED ANALYSIS
OTTAWA JULY 8-9
WASHINGTON, DC AUG. 12-13

If you would like more information, detailed course outlines, or would like to register please call toll free at 800-223-2452. In New York & Canada call collect 212-730-2670. On the West Coast, call 415-871-2800. In Europe 01-836-8918.

YOURDON

Yourdon Inc., 1133 Ave. of the Americas, New York, N.Y. 10036
Yourdon West, 851 Traeger Ave., Suite 350, San Bruno, California 94066
Yourdon Europe, 110-111 Strand, London WC2R OAA, England

Few Vendors Reveal New Mainframe Software

By Lois Paul
CW Staff

HOUSTON — Vendors of mainframe software for the most part did not use this year's National Computer Conference as a launching pad for new products. Most announcements of new software products were generally for microcomputer users.

Among the mainframe software vendors that did unveil new products was Westinghouse Electric Corp., which introduced three systems software products for IBM 370 and 4300 systems running under DOS/VS(E). Visual Aids is a group of on-line utility packages designed for use by systems and applications programmers for expediting the development, testing and maintenance of systems and applications software. The set of software tools cost $2,250 for Westinghouse Westi and Scepter users and $3,000 for CICS users.

Spoolprt was designed to enable users to select information from the IBM Power/VS(E) list queue and print it on any IBM 3280 series printer in the teleprocessing network. It is priced at $2,250 for the Westi version and $3,000 for the CICS version.

The third product, Matchbook, reportedly compares information from two computer programs and prints out discrepancies in the two files. Its price is $750.

All three Westinghouse products are being offered at these prices, which include a 25% discount, until July 1. The vendor is headquartered at 2040 Ardmore Blvd., Pittsburgh, Pa. 15221.

SAS Institute, Inc. announced the availability of SAS and SAS/Econometrics and Time Series (ETS) for IBM and plug-compatible systems running under DOS/VSE Release 2.0 or above.

For the first year and first CPU, the fee for the DOS version of SAS is $5,000, and the annual renewal fee is $2,000. SAS/ETS is available under DOS for $2,000 for the first year, first CPU and $1,000 each year thereafter.

The vendor also introduced a batch message processing interface for SAS/IMS-DL/1. Available free to current users, the interface is priced at $3,000 annually for new customers, according to SAS at SAS Circle, Box 8000, Cary, N.C. 27511.

Integrated Software Systems Corp. (Issco) announced Cuechart, a graphics software package designed to work with Issco's Tell-A-Graf graphics software to enable office personnel to create tailored graphics from standardized formats.

The price of Cuechart will be $2,500, with a special price of $1,800 if ordered within the three months following NCC. Cuechart will be available for delivery in approximately 60 days. Issco is based at 4186 Sorrento Valley Blvd., San Diego, Calif. 92121.

Among the microcomputer products introduced at the show was an implementation of a Unix-like operating system on IBM's Personal Computer by Mark Williams Co. This software is available for approximately $500 from the vendor at 1430 W. Wrightwood Ave., Chicago, Ill. 60614.

A Basic interpreter for the IBM Personal Computer was announced by Holland Automation U.S.A., Inc. The HAI/BAS Basic Compiler is priced at $450 from the vendor at 3400-D W. MacArthur Blvd., Santa Ana, Calif. 92704.

The Last One, an applications generator for users of Apple Computer, Inc.'s Apple II, Radio Shack Corp.'s TRS-80 and other microcomputers, was unveiled by Southwest Microcomputer Systems.

It is available for approximately $600. Southwest Microcomputer is based at Suite 220, 16885 W. Bernardo Drive, San Diego, Calif. 92127.

Kryptyk, a software encryption package designed to enable users of micros running under Digital Research, Inc.'s CP/M or MP/M operating systems to achieve program and data security without hardware modification, was announced by Epic Computer Products, Inc.

It is available for $250 from the vendor at Suite B, 10725 Ellis, Fountain Valley, Calif. 92708.

Micro Peripherals, Inc. introduced a graphics package called AP-PAK for users of Zenith Data Systems Inc.'s Z89 and Z90 microcomputer-based systems. The software is available immediately and retails for $55 from 4426 S. Century Drive, Salt Lake City, Utah 84107.

CW At NCC

Tools Debut for MVS Users

By Jeffry Beeler
CW West Coast Bureau

HOUSTON — Users of MVS-driven mainframes can reportedly optimize their systems' performance and plan their future capacity needs with a set of integrated software tools that made their debut at the National Computer Conference.

Boole & Babbage, Inc.'s latest IBM-oriented product family consists of three complementary components, all of which come under the company's Capacity Management Facilities (CMF) umbrella.

The three constituent modules include Performance Data Base (PDB), a Codasyl data base management system; Model, a facility for interactively modeling MVS and its operating environment's global features; and Workbench, a user interface that encompasses the other two.

CMF/PDB allows computing professionals and business planners to analyze historical data about their system's performance and then use the results of those analyses to help optimize their current data center operations, according to a Boole & Babbage spokesman.

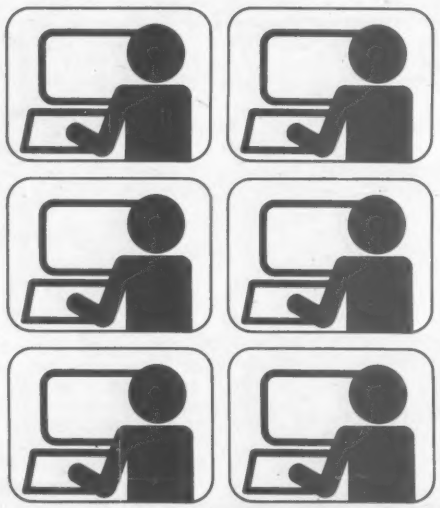
CMF/Model, by contrast, reportedly allows users to extrapolate from the same historical data and predict what their capacity needs are likely to be in the future.

Integrating the other two members of the CMF family is CMF/Workbench, which uses the same menu as the IBM 3270 and presents systems output in various pictorial formats.

CMF/PDB and CMF/Model cost $20,000 and $25,000, respectively. CMF/Workbench, which is necessary for the operation of the other two, costs $20,000.

All three products will be available during the third quarter from Boole & Babbage at 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Attention **SERIES/1** User



Use PXS with your EDX system and 1 programmer can do the work of 7

PXS
the application generator for the SERIES/1, installed at 1000 sites.

H&A computer systems, inc.

601 Montgomery Street, Suite 1411, San Francisco, CA 94111 415/434•3517

Wohl Warns Users About Hurdles On Road to Automated Office

(Continued from Page 1)

According to Wohl, by 1981 there were 50 million Americans in various office jobs ranging from clerical to management positions. "If we don't address the problems in terms of those people, I rather doubt we will be able to reach office automation in the form we have been working toward," she said.

Management/professional workstations cost between $1,000 and $35,000, she observed, adding that one with graphics and local storage should be available for less than $5,000. Taking a poke at the Xerox Corp. Star professional workstation, she cajoled, "Gee, Xerox, we wonder when you're going to get around to offering a Starlet rather than a Star."

Turning to personal computers, Wohl noted that one year ago no major vendors were offering them, and now nearly all of them are. For users, that means enjoying national account-level discounts and service.

In addition, over the next year personal computers will become integrated with overall product strategies, something Xerox is doing better than anyone else right now, she said.

Personal computers have increased in power to the point where they now have up to 256K bytes of processing power along with graphics and full-color options. To the extent they are configured for use by more than one person, she called them "very inexpensive professional workstations."

There are still software problems for personal computer users, however. Wohl claimed "CP/M compatibility is, in some sense, a myth," and noted many CP/M packages are games or lack support.

She questioned whether baseband local-area networks such as Xerox's Ethernet are "robust" enough to handle a wide variety of office applications. If users just want to pass data and text, they probably are, she said; if users are looking to include image and voice in their office transmissions, they may not be.

Using CP/M

Z80-Based Micros Most Notable OA Products

By Bruce Hoard
CW Staff

HOUSTON — Z80-based microcomputers running CP/M operating systems were the most notable office automation products introduced at the National Computer Conference here last week.

Cromemco Corp. unveiled its Z80A-based C-10 system. The C-10 system features 64K bytes of random-access memory (RAM), a 12-in. green phosphor CRT screen, Structured Basic language, a word processing package and a spreadsheet calculator program.

Using the CP/M operating system, the C-10 also includes a double-sided, double-density disk drive, a detachable keyboard, both an RS-232 serial and parallel port and RS-232 modem port with full handshake capability. This Super Pak package costs $1,785.

The system's components are available individually. For instance, the basic C-10 personal computer without keyboard costs $995; the keyboard costs $195; the 390K-byte floppy disk drive, $595; and a letter-quality printer, $895.

Cromemco is located at 280 Bernardo Ave., Mountain View, Calif. 94043.

Targets Small Businesses

Toshiba America, Inc. took the wraps off its T100 personal computer aimed at small business use. In addition to its CP/M operating system, the T100 personal computer features three standard memory units, up to 1M byte of external floppy disk memory, several I/O video screen arrangements and high-resolution color graphics.

For main memory, the T100 uses 64K bytes of RAM. It also uses 32K bytes of read-only memory (ROM) for Basic language and a 16K-byte memory for video. RAM and ROM packs of 32K bytes are available as options.

Built around a Z80A microprocessor, the personal computer features a 90-key detached keyboard and five I/O screen options, including a flat-panel liquid crystal display showing eight lines of 40 characters each. Its graphics displays present an array of 640-dot horizontal lines and 200-dot vertical lines.

The T100 in a typical configuration costs $2,485 from Toshiba America at 2441 Michelle Drive, Tustin, Calif. 92680.

Micro Workstation

Zilog, Inc. introduced its MCZ 2/60. In addition to running CP/M, the Z80-based microcomputer workstation also runs Zilog's RIO operating system, enabling it to serve as a node on the Z-Net local-area network.

The basic MCZ 2/60 system includes two standard microcomputer boards. A processor board, based on the Z80, contains a Centronics-compatible parallel printer interface. It also contains a Z-Net interface. A RAM/ROM board contains 64K bytes of memory.

The system also includes a serial port for asynchronous or binary synchronous communications (BSC) or serial printer connection. An optional 2.4M-byte disk drive subsystem, the FDZ 2/34, is also available. Options on the RIO operating system include Cobol, the Wordstar word processing package and Zilog's asynchronous communications software, Asynch.

Packaged with an FDZ 2/34, the MCZ 2/60 costs $8,450 from Zilog at 1315 Dell Ave., Campbell, Calif. 95008.

The LEX-31 portable personal communications computer from Lexicon Corp. measures 8½ in. by 11 in. by 2¾ in. and features a full Ascii keyboard, 40-col thermal printer and an integral 300 bit/sec modem.

The LEX-31 device can be used from any phone booth, and it allows users to communicate with office computers, a data bank, time-share computers or to get credit verification.

CW At NCC

A free Dow Jones password and one free hour of system usage on the Dow Jones News/Retrieval Service come with the LEX-31.

It costs $995 from Lexicon at 1541 N.W. 65th Ave., Fort Lauderdale, Fla. 33313.

BBN Computer Corp. announced four information management capabilities for its C Machine family. The packages include the Infomail electronic mail system, the EZcalc spreadsheet modeling program, the NPP text-formatting preprocessor and an enhanced release of Pen full-screen editor.

The prices are $20,000 for Infomail, $500 for EZcalc and $1,500 for Pen; Pen is bundled at no additional charge, according to BBN, which is located at 33 Moulton St., Cambridge, Mass. 02238.

GOOD COMPUTER STUFF CHEAP!!!

NEW AND USED

TI745
Used-$595
30 Day Warranty

CD 1203
Portable
Reburbished-$795
90 Day Warranty
Used-$595
30 Day Warranty

- Bullet Proof Case*
- Light Weight–Compact Size of a Briefcase
- Faster Than A Jet Plane*
- Nationwide Maintenance
- Best Quality Portable Ever Built
- Built-in Modem—Acoustic Coupler
- You Won't Find A Better Buy

Special: CD 1132 Wide Carriage Portable–Refurb. $750

*Not Really but it's tough! 30 CPS.

DEC PDP 11/LSI MODULES—NEW

BA11-NE	$ 955		
MK11-BE 64K	11,180		
MK 11-BF 256K	13,500		
MK11-CE 512K	6,600		
H9602 EA	1,925		
QP100-CQ	1,225		
RK-07	8,400		
RLV21-AK Disk Drive & Ctrl (10 Meg)	3,300		
RLV11-AK Disk Drive & Ctrl (5 Meg)	2,900		
MK11-CF	19,950		
MS11-MB	3,990		
DH11-AD	6375		
BA11-KE	2,398		
MS11-LD	2,240		
MS11-LB	1,710		
RL02-AK Disk Drive (10 Meg)	2,800		
RL01-AK Disk Drive (5 Meg)	2,200		
KDF11-AA	1,200		
MSV11-DD	390		
PB11K-AA	$585	DPT 9214	5200
DS3ST	65	DLV11-F	158
H317-F	675	RM03-P	450
QJ013-GZ F/RT11 Doc. Kit	22	R3D1K-10	45
MRV11-BA	195	W9511	95
QJ013-CX	575	W9512	50
QJ980-CY	175	DPT 9216	35
QJD59-CY	775	BCO 3M	55
QP230-GZ	22	IBV11-A	455
DL11WA	540	DL11-E	775
DD11-CK	295	DRV11	125
H9270	75	DRV11-P	188
		H9273	295

ALL NEW

TERMINALS

DEC	NEW	USED
LA-120 AA	$1,945	$1,495
LS-120 AA (120 CPS)	995	795
LA-36 DK	950	595
VT-52	1,295	—
LA-180	695	475
LA-34 DA	795	—
VT-100	1,395	995
VT-101	925	—
VT-131	1,430	—

TELEVIDEO		
950	$865	$ —
912B	655	—
920C	—	495

LEAR SIEGLER		
ADM-3A	$575	$395
ADM-5	625	450

DIABLO		
1620-1	$ —	$1,395
1640-1	—	1,495
1641-1	—	1,450
1650-1	2,670	2,195
Xerox 1750-1	2,870	—
1660-1	—	595
DTC 300 (Same as 1620)	—	595

DEC SYSTEMS

11/23 AB 128KB 110/240V	$4,950
11/24 BD 256KB 110/240V	9,950
11/34A-YF 256KB	12,500
3315A-RZ	6,500

ALL NEW

PERIPHERALS

TECHTRAN	NEW	USED
818	$1,255	$ —
8400	1,095	395
8420	1,200	550
8421	1,250	595
950	1,195	—
815	—	295

MODEMS & COUPLERS

VENTEL		
120	$ 75	$ —
103	—	100
1212	450	—

ANDERSON-JACOBSON		
1245	$ —	$395
242-36	225	100
243	225	100
242-A	250	125
ADAC 1200	450	350
1258	—	695
AJ 1255 (Vadic 3455)	595	—

DEC OPTIONS

4K Buffer for LA-120	$225	—
APL for LA-120	85	—
Forms Control for LS-120 (Min. 5)	75	—
20 Ma I/F for LA-34	80	—
Ext. Logic for LA-34	100	—
Interfaces for LA-180	200	—

MISC. TERMINALS

Hazeltine 1400	$ 675	—
Hazeltine Model 1	1,595	—
Infomer D 304	1,250	—
Okidata SL 250	2,950	—
Teletype 43 AAA	895	595
GE 2120 KSR	1,450	—
GE 2030 KSR	825	—

TBC TERMINAL BROKERS CO.
2001 West Main St.
Suite 304, Stamford, Ct. 06902
203-964-9331
Limited Quantities

Show Floor Poll

How Do Women Moving Into Management Fare?

By Marguerite Zientara
CW Staff

HOUSTON — Do women in DP face special problems when they switch from technical to management positions?

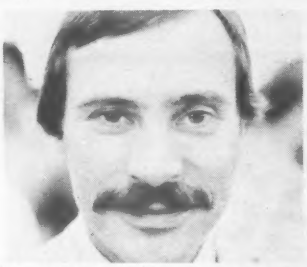
Of 10 NCC attendees interviewed as they waited in line to register here last week, five said "no," four said "yes" and one woman who is being groomed for a management position said she hoped not.

Wendy Thompson, technical instructor, Texas Instruments, Inc., Austin, Texas.

CW Photos by J. Bertino

Russell Allen, programmer, Hughes Drilling Fluids, Houston.

Paula Lockwood Olson, data management manager, TRW Corp., Redondo Beach, Calif.



James Joyce, market analyst, Raytheon Data Systems, Norwood, Mass.

Les Spencer, assistant data manager, city of Cleveland.

Melinda Rowe, senior market analyst, Yates Ventures, San Francisco.

CW At NCC

Wendy Thompson, a technical instructor for Texas Instruments, Inc. in Austin, Texas, does not anticipate many problems upon her entry into management. "At our company, we have lots of women managers and they don't have any problems; they are accepted as managers.

"The size of the firm may be a factor," she added, noting that "There usually aren't sexual harassment problems in large companies."

Nevertheless, from the data management manager of another large firm, TRW Corp. in Redondo Beach, Calif., the general word was "Yes, they do."

Paula Lockwood Olson explained, "It depends on the company: one company will think women are more technical- than management-oriented and the next company will think just the opposite.

"Women must have the technical expertise to establish credibility," Olson said. "Once they have the technical capabilities, then they're ready for management.

"I definitely want to see more women in management and I'm promoting competent women just as fast as I can," she added.

Credibility is the watchword in the eyes of many regarding this issue. Saying that women "definitely" face "lots of barriers in a male-oriented industry," Melinda Rowe, senior market analyst for Yates Ventures in San Francisco, noted that credibility is the major problem faced by women moving into DP management.

"It's a whole different world for women, who are not oriented toward DP, with the added problem of having to manage male programmers," Rowe said.

'Wise, Shrewd and Clever'

"It's a continuous job in which one always has to be on the alert and agreeable," she observed. "If you're not a women's libber type and have come up through the ranks, then you're someone who has had to be wise, shrewd and clever and has only opened your mouth when you were sure of the right answer."

Russell Allen, a programmer for Hughes Drilling Fluids in Houston, felt women do have problems moving into management "just in the way people look at them. I don't know why and I don't understand it, but they seem to be overlooked for things."

Another respondent pointed out, "I don't think women in DP face any more difficult problems than any women in management. Entering management is the problem, not entering management in DP," observed Les Spencer, assistant manager of the data center for the city of Cleveland.

"The primary problem is being accepted as a manager," Spencer said, "and that depends on making the transition from saying 'I am a woman' to saying 'I am a business person.' That's the hardest part."

Of the optimists in the group surveyed, Shirley Renk, general office DP manager for AEI Corp. in Irvine, Calif., led the pack. "If a woman is smart enough to get there on her own, she will have no more problems than a man."

James Joyce, market analyst for Raytheon Data Systems in Norwood, Mass., agreed to the extent that his own manager "started on the software side and she's in planning now. I don't think she's having any problems; in fact, she's doing very well."

While acknowledging that some corporations might have such problems, Project Leader Clarence Mitchell of Brown & Root in Houston claimed no such problems exist in his company, at least "not overtly."

"I think women are progressing a whole bunch although they might have some problems," Mitchell said. "My manager was a woman and I have a woman working for me in a management position."

While Gay Goforth, security and audit officer for distributive equipment in the Texas Department of Human Resources, has "not personally found it to be true," she noted that there are "not a whole lot of women in management in my technical area.

"I don't think it's a conscious move to exclude them, but when I reflect on the number of women there, it makes me wonder," she added.

In Japan, there is "still a kind of prejudice against women," explained Kawaguchi Tim, a manager with the Tokyo-based Tel America branch in Los Angeles.

Nevertheless, he said, "In our company, there are several female software engineers who are superior to their fellow workers. I don't think there are any problems.

"In Japan," he noted, "women in management are just taking off."

SLASH COSTS 75%
SAVE ON IBM 3276/3287 REMOTES

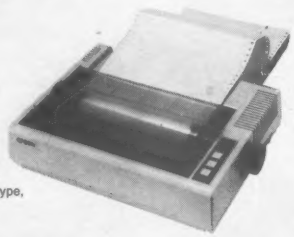
Replace your IBM terminals with a $2,395 Beehive DM3270 and a low cost printer from Electronic Distribution Processing, Inc.

WITH THE BEEHIVE DM3270 YOU GET:

integrated controller...CRT display... keyboard...separately addressable, buffered printer port...ability to attach serial ASCII printers operating as though they were EBCDIC 3287's...EBCDIC code...3270 bisync protocol... local print of screen (all 24 lines)...choice of 3275 dialup or 3276 leased line mode...exchange or onsite service from over 400 locations...full 3278 type keyboard including cursor select... numeric pad...PF1-24 keys...and composite video output option to drive additional screens or projection equipment.

PRINTER CHOICES ARE ALMOST UNLIMITED!

For example, the 80 CPS 80 column EPSON MX-80 (selected by IBM for their new small computer) sells for $720 and leases for $38 per month with EDP Exchange Service. For 132 column requirements, consider a TI 810 (150 CPS) which leases for $96 with onsite service. EDP also stocks printers for use with the DM3270 from Mannesman Tally, Okidata, Teletype, Diablo, and others.



YOUR DM3270 AND PRINTER MAY EVEN BE FREE!

If you have been leasing a comparable IBM 3276/3287 combination for over 2 years and have accumulated rental credits, we can help you convert these credits to cash, buy out your lease, and/or cover up to 100% of the cost of a new DM3270 and printer.

AND IF THAT WASN'T ENOUGH...

EDP offers immediate delivery of the DM3270 as well as printers, GDC or UDS modems, modem sharing units (to add additional terminals), and all cables to complete a system — right from our own warehouse. EDP also has dial-up support for 3275 and 3276 modes including modems and telephone adapters for customer demos and trade shows. Only EDP offers a variety of lease and purchase programs designed to fit your needs, including lease upgrade options to Teletype 4540 cluster systems; 15 day free trials; and technical support from a team that has installed over one thousand 3270 compatible terminals in the past 18 months.

CALL TOLL FREE 1-800-521-0302

(313-353-7272 in Michigan) and we'll tell you anything you want to know about the Beehive DM3270 and EDP Inc.

ELECTRONIC DISTRIBUTION PROCESSING, INC.

27230 LAHSER ROAD • SOUTHFIELD, MI 48034

SALES OFFICES: CHICAGO • CINCINNATI • DALLAS • OMAHA • SOUTHFIELD

Firms Unveil On-Line Products, Net Updates

By Phil Hirsch
CW Washington Bureau

HOUSTON — Several new on-line terminal products and communications network enhancements were shown at the National Computer Conference last week. They included the following:

• A 3270-compatible information display system from Control Concepts Corp., Arlington, Va., priced at $3,350, which the manufacturer said provides cost-savings of 40% to 70% over the comparable 3276-12 models. The Control Concepts CC-3276 terminal uses the Synchronous Data Link Control protocol and is compatible with Systems Network Architecture PU Type 2 specifications. Control Concepts, a division of Presearch, Inc. is at 2351 S. Jefferson Davis Highway, Arlington, Va. 22202.

• Applied Digital Data Systems, Inc. (Adds) showed the Viewpoint/60, which they described as "a smart editing terminal at a dumb terminal price" — $895 in single quantities. It supports transmission at 110 bit/sec to 19.2K bit/sec. and includes EIA RS-232C, RS-422, or current loop interfaces, the company said. Adds is at 100 Marcus Blvd., Hauppage, N.Y. 11787.

• Topper, described as a telecommuting console for 3270 networks, was introduced by Beehive International, Inc. Key features are said to include a fullycompatible 3278 keyboard, 12 in. high-resolution monitor and three operational modes. As a stand-alone CP/M-based computer it has 64K bytes of random-access memory and 500K bytes or 1M byte of floppy disk storage. Topper is priced at $2,495 to $2,995 from the firm at 4910 W. Amelia Earhart Drive, Salt Lake City, Utah 84125.

• A terminal module that reportedly adds telex, TWX and long-distance dial-up capability to an existing terminal, computer or word processor was introduced by Datatronix, Inc. The Dataport II also performs speed and code conversion and provides store-and-forward message transmission, the company said. Price of the Dataport II is $1,250. Datatronix is at 2100 Reston Ave., Reston, Va. 22091.

• The 3270-6, a new clustered terminal controller that emulates the IBM 320, was introduced by Datamedia Corp. Simultaneously, the company unveiled the 3270-8, which reportedly can communicate with an IBM host at speeds up to 9,600 bit/sec using binary synchronous line protocol. Prices for the 3270-8 start at $1,995 and for the 3270-6 at $2,895 from Datamedia at 7401 Central Highway, Pennsauken, N.J. 08109.

CW At NCC

• Axlon, Inc. of Sunnyvale, Calif., announced a hand-held portable data terminal, the Axion Datalink Series 1000, which includes a 16-char. display, 224-char. storage capacity, RS-232C output port and built-in phone modem. Axlon is at 170 Wolfe Road, Sunnyvale, Calif. 94086.

• Paradyne Corp. announced a personal/business computer option for its Pixnet and Response systems, which the vendor said features both desktop computing and IBM 3270 interaction with the host computer. Dubbed the PDS 270 Option, it is implemented on the already announced PDS 270 terminal, which includes a visual display terminal, microprocessor, disks, printers and the MS-DOS operating system. A keyboard switch changes the unit from a 3270 to a stand-alone personal computer. The option costs $3,500. The terminal costs $3,000 from Paradyne at 855O Ulmerton Road, Largo, Fla. 33541.

Sytek Introduces Control Center

HOUSTON — A network control center for the Sytek, Inc. Localnet was introduced at the National Computer Conference here last week. Consisting basically of a microprocessor-equipped CRT and keyboard, the unit provides resource management, performance measurement and encryption services to Localnet nodes.

The basic version of the 50/100 Network Control Center is priced at $18,000. Its main functions are to control access to specified network resources — for example, a laser printer or restricted files — and to provide logical addresses for plain English addresses input by users.

The Network Control Center's basic configuration includes an integral 10M-byte Winchester disk, an 8 MHz Motorola MC68000 microprocessor, 256K bytes of memory and RS-232C-compatible asynchronous and synchronous interfaces.

Included in last week's announcement were two software enhancements to the basic Network Control Center — a "digital monitoring service that measures performance, and a "key distribution center" that performs message encryption. Pricing for these enhancements has not yet been set, the vendor said, but indicated they would each sell for approximately $2,000. Sytek is headquartered at 1153 Bordeaux Drive, Sunnyvale, Calif. 94086.

Purdue Professor Receives Award

By Bruce Hoard
CW Staff

HOUSTON — Prof. King-sun Fu of Purdue University received the Harry Goode Memorial Award at the National Computer Conference last week in recognition of his outstanding contributions to the information processing sciences.

CW Photo by S. Blakeney
King-sun Fu

Fu was honored for his work in the field of theory of syntactic pattern recognition, which with statistical pattern recognition makes up the discipline of pattern recognition.

In the realm of industry, his work led to applications such as filament quality controls and fingerprint recognition and in medicine, to blood cell classification.

In 1981, he received the American Society for Engineering Education Senior Research Award and in 1982, the Institute of Electrical and Electronics Engineers Education Medal.

Don't Be 'Machine-Minded,' Exec Warns at Plenary Talk

By Tim Scannell
CW Staff

HOUSTON — Do not neglect the individual. Don't be "machine-minded." Be aware of the persuasive as well as pervasive effect computers can have on your life.

These thoughts may seem almost contrary to the spirit of an event like the National Computer Conference, where the spotlight is focused more on the machines and technology than on the people flooding the exhibition floor. But it was part of the message Theodore A. Burtis had yesterday for attendees at the show during a plenary session that dealt with a variety of subjects including people, computer technology and the U.S. free-enterprise system.

Burtis is chairman of the board and chief executive officer of Sun Co., reportedly the 11th largest firm in the nation and the 17th largest industrial company in the world.

Just before Burtis began his speech, which was targeted partly at the importance of humanity in computing, the American Federation of Information Processing Societies, Inc. (Afips) awarded Dr. King-sun Fu its Harry Goode Memorial Award for his contributions as a teacher in the engineering profession. Afips also cited Fu for his work at Purdue University in the area of pattern recognition and image processing (see related story).

In his speech, which was compared by some of the attendees to a pep talk, Burtis stressed the commitments vendors and computer users have to people both in and outside the industry.

Referring to the present-day world as a giant "Rubik's Cube," with everybody twisting and turning it in different directions, he warned "if we don't deal with the problems of the present, the promise of the future is likely to elude us."

The first issue Burtis attacked in his short speech is the habit some people have of placing more importance on machines than on the people who are affected by them. He also chastised those people who consistently resort to cut-and-dried technical plans of action, at the expense of creativity.

"The Mona Lisa couldn't be painted by a committee and no task force could have composed Beethoven's Ninth," he quipped.

Companies must maintain effective communications with the public and not assume they know what you do or how the technology will affect them. "Take it from one who has a great many scars," he added, drawing on his experiences as an oil company executive.

Turning the other cheek, Burtis also warned his listeners not to neglect the technology. Vendors and users have to make long-range investments of their money and their minds.

"We are a nation of chronic tinkerers and we'd better continue to be," he warned. He also focused on people and companies that need computers but might be afraid of automation. "Companies that do not take advantage of the technology run the risk of being dominated by those that have."

Burtis chastised those vendors that have made errors a part and parcel of everyday business. First drafts of reports — which are common business items — are simply acknowledgements that they are not the best work. And it is no longer unusual to include repair kits with products sold to the public.

CW At NCC

DPMA CHICAGO '82
October 17-20, Chicago Marriott

DPMA '82 CHICAGO

Managing For Success
Stay On Top of Tomorrow

Join Data Processing Management Association and thousands of information processing executives in Chicago for three information packed days of seminars, workshops, general sessions and an exhibit show designed to display the latest in automated products and services. The international conference is open to all information processing executives and offers the most complete educational program of its kind.

Choose sessions from five distinct tracts and develop your personalized educational format.

Information Management Concepts— Covering Decision Support Systems, Information Resource Management and Capacity Planning

Managing Self— Will help you with Managing Stress, Career Planning and Self-Assessment

Information Management/Technical— With sessions on Local Computer Networks, Graphics and the Status of Value Added Networks

Managing Others— Directed at Quality Circles, Performance Evaluation and Controlling Conflict

Future Information Directions— Concerning Robotics, Planning for Technology of the Future and As an Executive—Where's My Office/Working from Home

Over 180 booths will fill two floors of the Chicago Marriott exhibit area with the nation's top EDP companies displaying their latest equipment, supplies and services.

Chicago is noted for its music, from jazz to the Chicago Symphony, its exquisite shops and shopping malls, and restaurants with every type of cuisine. DPMA has provided a complete selection of guest and special entertainment activities. Send today for full details.

Send to: DPMA Chicago '82
505 Busse Highway, Park Ridge, IL 60068-3191

Name/Title

Company

Address

City/State-Prov./Zip-Postal Code

Telephone

Please send:
- ☐ Conference registration materials
- ☐ Free exhibit-viewing tickets
- ☐ My company's interested in exhibiting
- ☐ Send exhibit information
- ☐ Membership information

The floor was a jungle-like maze of people and products.

Would you buy a graphics system from this man?

NCC '82

Photo Feature
By Susan Blakeney
And Vic Farmer

The eyes of Texas are upon you.

Guess what state NCC was in this year?

It was hard to tell where registration lines began and ended.

A good ol' boy saddles up to a printer.

Let's check the map before we go any further.

Ron Boley fine tunes the Execuport.

Richard Leslie demonstrates Decmate II.

CW Photo by S. Blakeney

Waiting for the Exhibit Floor to Open

Checklist Outlines Procedure For Selecting, Evaluating DBMS

HOUSTON — What do you do when your first assignment with a firm is to evaluate and select a data base management system (DBMS)?

What Edward Davidson of the Military Programs Department of General Electric Co.'s Space Systems Division did was quickly to put together a methodology and checklist.

He shared the results during a session on "Evaluating Data Base Management Systems," at the National Computer Conference here last week.

"Consider what you go through when you purchase a major appliance or a car," Davidson said. You determine the type of car you need and then begin a series of steps to decide what you need and compare and eliminate some of your possible choices, he said.

Purchasing Steps

"You use the same steps when selecting software," Davidson said. He then outlined the procedure that he followed:

• Define evaluation resources. Davidson described this as including housekeeping functions, such as determining the staff that is available; deadlines; budget; support services available; and user contacts.

• Identify the operating environment, including the hardware, operating system and any future changes in this environment that are planned.

• Identify candidate software by reading publications and directories.

• Solicit product documentation. Davidson said that even sales brochures, although not heavily detailed, can be useful in eliminating products that do not include all requirements that have been identified as critical.

• Define DBMS requirements. According to Davidson, the organization should prioritize these, assign weights to critical requirements and categorize them by DBMS feature and function.

• Define evaluation criteria. This is the same type of classification procedure conducted in Step 5, Davidson noted, only on a more detailed and specific level.

• Survey product reviews included in periodicals and interview users. "When we contacted vendors to get copies of literature, we also asked for two or three references," Davidson affirmed.

• Review products. Davidson said that his technique was to develop forms that enabled him to summarize the product information by key features and compare each offering.

CW At NCC

• Arrange selected demonstrations. Carefully review the demonstrations, particularly regarding the most critical features for your organization, he advised. One should be aware of what kind of machine it is being run on and whether or not that machine is loaded, so that performance degradation can be determined.

• Make initial recommendation, unless benchmarking is possible.

• Run selected benchmarks, if possible. According to Davidson, he was able to arrange for vendor benchmark tests. He noted that although they are more costly, user-conducted benchmark tests provide better control.

• Make final recommendation and document it.

TONE 3

High Performance – Low Overhead

TSO for VS1

Compare these Features:

- Identical TSO command syntax (we use their manuals)
- Full TSO CLIST capability
- TSO TEST command support
- SPF support
- No retraining for MVS/TSO
- Full Screen Edit capability
- Dynamic allocation
- Hot internal reader
- Review output at the terminal
- Interactive program execution
- On-line testing and compilation
- No user swapping
- Multiple users per partition
- Shared Subpools
- Re entrant code
- Enhanced 3270 support
- Full ASCII terminal support
- Powerful Sys. Prog. package
- Standard VS datasets (No intermediate programs required)
- Programmable PFK support
- Run TSO packages under VS1
- THE ONLY TRUE TSO FOR VS1

• WORLD WIDE SALES AND SUPPORT

TONE Software Corp.

Call or Write for Details

1735 SO. BROOKHURST ST.
ANAHEIM, CA 92804
PHONE: (714) 991-9460
TELEX: 181592

If you need DEC
You need . . .

J.P. Hearne & Associates

We Buy and Sell Everything From Packs to Complete Systems !

We Have Emulex Disk, Tape and Communication Controllers IN STOCK !

All Equipment is *Guaranteed !*

WE CAN SAVE YOU TIME & MONEY !

CALL TODAY (805) 497-4442 (CALIF.)
(817) 870-1422 (TEXAS)

or TLX 182640

J.P. Hearne & Associates
2426 Townsgate Rd., Suite E
Westlake Village, CA 91361

J.P. Hearne & Associates
1200 Summit Ave., Suite 710
Ft. Worth, Texas 76102

Raise your "Programmer Productivity" to new heights

If you're writing Fortran programs and need mathematical or statistical solutions, use the IMSL Library to shorten your programming time and increase your problem-solving time.

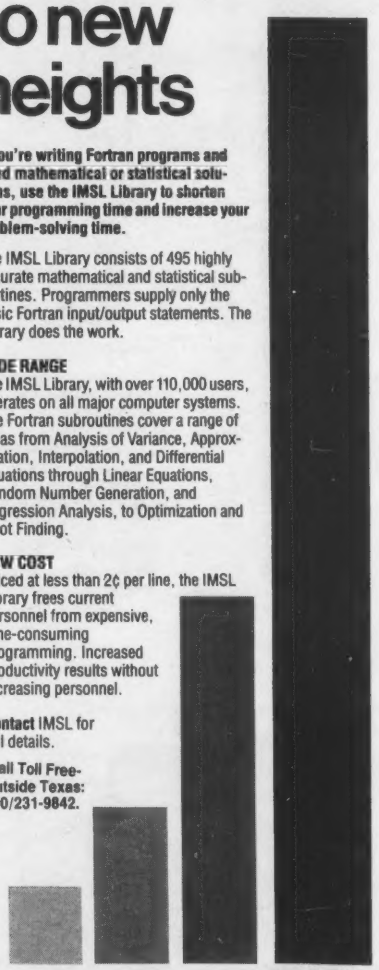
The IMSL Library consists of 495 highly accurate mathematical and statistical subroutines. Programmers supply only the basic Fortran input/output statements. The Library does the work.

WIDE RANGE
The IMSL Library, with over 110,000 users, operates on all major computer systems. The Fortran subroutines cover a range of areas from Analysis of Variance, Approximation, Interpolation, and Differential Equations through Linear Equations, Random Number Generation, and Regression Analysis, to Optimization and Root Finding.

LOW COST
Priced at less than 2¢ per line, the IMSL Library frees current personnel from expensive, time-consuming programming. Increased productivity results without increasing personnel.

Contact IMSL for full details.

Call Toll Free-
Outside Texas:
800/231-9842.



IMSL

7500 Bellaire Blvd./Houston, Texas 77036
713/772-1927/Telex 79 1923 IMSL INC HOU

Professional Attitude Said Key to Success in DP

By Marcia Blumenthal
CW Staff

HOUSTON — Adopting a professional attitude is the key to surviving in today's fast-changing DP environment.

That was the message delivered by panelists at a session held at the National Computer Conference here last week.

The role of DP in the corporate environment has changed dramatically in the past few years, noted Herb Safford, staff administrator of GTE Data Services, located in Marina Del Rey, Calif. The obvious manifestation of this is the change in the names being applied to DP and the professionals in the discipline. DP now goes by names such as information management, and the DP manager has become the information resource manager or some other similar title, Safford observed.

While these titles may sound impressive, DPers, in many cases, have yet to adapt to the professionalism increasingly being required by companies, charged Alex Hoffman, a consultant in Fort Worth, Texas.

Many computer professionals are more loyal to their profession than they are to their companies, Hoffman added. "If you perceive yourself as company independent and your company feels you are that way, they view you as a piece of meat," Hoffman concluded.

But if computer professionals want a career path in their companies, they must relate their expertise to the needs of the end users in the company. In this way they are aligning their professionalism with the goals of the company, agreed Hoffman and Safford.

Identifying the goals of your company is critical to professionalizing the role of the DP employee, Safford said. For example, the recent settlement of the antitrust case by AT& T and the U.S. Justice Department has completely changed the communications industry.

CW At NCC

Now that competition is allowed in the industry, more DP applications are going to be necessary by communications-related firms. This will change the career paths of computer professionals in this industry.

Whatever the nature of the business in which a company competes, computer professionals, in general, should start viewing themselves as consultants to end-user departments.

The growing number of companies setting up information centers is a manifestation of the consultancy role that DP professionals are increasingly being asked to play by their companies, Safford said.

As users gain more access to computer systems, security will become more of an issue, Safford noted, suggesting the emergence of a system support professional as a new career path for DPers.

CW Photo by S. Blakeney
Alex Hoffman

Professionalism Made Easy

HOUSTON — Creating a professional environment for DPers is both the responsibility of the computer professionals and the company for which they work, according to consultant Alex Hoffman. Hoffman made the following suggestions for increasing professionalism at a National Computer Conference session last week:

- Read professional books and periodicals on your own time.
- Become an expert in one area of computing.
- Work constantly to improve technological skills as well as communication skills.
- Agree to have your work reviewed by peers.
- Work according to company practices and policies.
- Participate in the activities of at least one professional organization.
- Be prepared to work overtime when required.

For the employer, Hoffman offered the following suggestions:

- Subsidize membership in a professional organization for the employee.
- Establish a technology library or "bookshelf" in a designated part of the company.
- Support travel to national professional meetings once a year.
- Support attendance at local meetings once a month.

Protecting Consumers

Old Laws Affect New DP Industry: Attorney

By Bob Johnson
CW New York Bureau

HOUSTON — Although new litigation is affecting the computer industry, old standard laws are making a comeback, according to Susan Nycum, an attorney with the firm of Gaston, Snow and Ely Bartlett.

Nycum, leader of the session "New Laws in Computing" at the National Computer Conference here last week, explained that, for the first time in computing, laws that apply to the protection of the consumer are making headway into what is traditionally a business area. Vendors that either use or produce packaged software and computer games have to be aware of these new laws — an area with which they were not concerned in the past.

Hardware manufacturers that make agreements with software companies producing packages that are considered consumer goods are responsible under these consumer protection laws, Nycum pointed out.

Nycum gave as an example a situation in which a microcomputer, which is designed to be sold in the business marketplace, is linked with software produced for consumers. She said this type of situation illustrates how old laws can apply to a new marketplace.

By virtue of having an agreement with a company that produces something governed by consumer laws, the computer vendor becomes liable if something goes wrong, she explained.

Product Liability

Another old law affecting the computer industry, according to Nycum, is that of product liability. In the past, people were not being physically hurt by computers, but with the proliferation of robotics and computer-aided design and manufacturing (CAD/CAM), the possibility now exists. She cited a recent incident in which a Japanese worker was killed by a robot and cautioned that this type of potential legal hassle must be considered by the computer industry.

"This body of law, which protects the man on the street, can now be brought into place. Although CAD/CAM products are designed to function properly, they can run amok and cause a potential legal problem," she stated.

Concerning new laws that are springing up in the computer arena, Nycum talked about trends in software patents. Progress being made in this area is "quiet," she said, and offered some reasons to explain the relative silence.

About 50% to 75% of all patent cases are ruled invalid; if a software patent is challenged and ruled invalid, a vendor's "whole show" might be lost, Nycum said. Most patent attorneys do not have enough computer industry experience to handle a patent case of this kind successfully. "These lawyers might be playing a game of catch-up," she said.

CW at NCC

Programmer Productivity Debated

By Jim Bartimo
CW Staff

HOUSTON — Programmer productivity is a very complex problem with no simple solution. That, at least, was the consensus at a National Computer Conference session titled "Programmer Productivity," chaired by Lynne Weber, a senior consultant in systems development, Management Consulting Department at Peat, Maverick, Mitchell and Co. in New York.

"Most organizations looking at productivity are really talking about management techniques," Weber said. To improve these techniques, Weber has developed a model for the management of a data processing organization.

Paramount in this model are the goals and objectives of the total organization. The tasks of that organization must relate to these goals, and the organizational structure must relate to the tasks, Weber said.

Information and decisions are the next rung on the model's ladder, followed by the people and a reward system. This rung-by-rung structure was designed to put the various factors of the organization in the proper order to allow greater programmer productivity.

Weber gave an example of one organization she studied in which the reward systems were not in order with the other areas of the model. Because the pay scale did not meet industry standards at this company, programmers were promoted to inflated titles for which they were not qualified in order to receive a better wage. Job dissatisfaction ensued and turnover increased. Filling the inflated positions ended up costing the department as much money as it would have cost to meet industry pay standards in the first place.

Best Road

Two other panelists disagreed on the best road to productivity. David Goldstein from MIT's Center for Information Systems Research suggested a more subjective approach to programmer productivity by relying on end-user satisfaction.

Goldstein expressed concern about productivity aids and said, "If the programmers don't like the productivity aids, they will result in more problems."

Richard Harris of Xerox Corp. said, "All of those human factors are nice, but they won't get you what you want.

"Programming is not a homogeneous activity," Harris said. "It varies from place to place." He suggested the use of structured programmer productivity aids.

ANOTHER QWIKTERM SPECIAL

VT-125
only $1295

Retrographics Board allows VT-100 to display graphics

Three Month Leases Available

• Boston (617) 246-1665
• Chicago (312) 595-7733
• Los Angeles (213) 417-8003
• New York (212) 564-7731
• San Francisco (415) 461-0923
• Wash., D.C. (703) 522-1210

CICS
COBOL APPLICATIONS
EATING UP YOUR SCHEDULE & BUDGET?

INVESTIGATE EASYSCREEN/CICS©

THE DEVELOPMENT TOOL THAT CREATES WORKING BMS MAPS AND GENERATES COBOL PROGRAMS IN MINUTES. EASYSCREEN/CICS© USES STANDARD VSAM OR DL/I ACCESS TECHNIQUES WITH ADD, UPDATE AND DELETE CAPABILITIES FROM A STANDARD SPECIFICATION FORM.

Contact: (208) 342-6878

PRODATA INC.
663 S. Capital Blvd.
P.O. Box 44191
Boise, Idaho 83704

EDP LESSONS FROM LOSSES®

Dean W. Westover
Licensed Insurance Adviser
40 Broad Street
Boston, Massachusetts 02109

Learn from actual EDP losses

Mechanical breakdowns
EDP errors and omissions
Unauthorized computer access
Insurance contract comparisons
Security system effectiveness
Loss prevention check-lists

Return in window envelope with your name and address for subscription information. Free charter subscriptions to selected groups.

CLIP AND RETURN

TERMINALS FROM TRANSNET

PURCHASE PLAN • 12-24 MONTH FULL OWNERSHIP PLAN • 36 MONTH LEASE PLAN

	DESCRIPTION	PURCHASE PRICE	PER MONTH 12 MOS.	24 MOS.	36 MOS.
DEC	LA34 DECwriter IV Forms Ctrl.	$1,095	$105	$ 58	$ 40
	LA100 Letter Printer RO	1,995	190	106	72
	LA120 DECwriter III KSR	2,295	220	122	83
	LA120 DECwriter III RO	2,095	200	112	75
	LA12A Portable DECwriter	2,950	280	155	106
	VT100 CRT DECscope	1,695	162	90	61
	VT101 CRT DECscope	1,195	115	67	43
	VT125 CRT Graphics	3,295	315	185	119
	VT131 CRT DECscope	1,745	167	93	63
	VT132 CRT DECscope	1,995	190	106	72
	VT18XAC Personal Computer Option	2,395	230	128	86
TEXAS INSTRUMENTS	TI745 Portable Terminal	1,595	153	85	58
	TI765 Bubble Memory Terminal	2,595	249	138	93
	TI940 CRT	1,795	173	96	65
	TI785 Portable KSR, 120 CPS	2,395	230	128	86
	TI787 Portable KSR, 120 CPS	2,845	273	152	102
	TI810 RO Printer	1,695	162	90	61
	TI820 KSR Printer	2,195	211	117	80
LEAR SIEGLER	ADM3A CRT Terminal	595	57	34	22
	ADM5 CRT Terminal	645	62	36	24
	ADM32 CRT Terminal	1,165	112	65	42
DATAMEDIA	EXCEL 12 CRT Terminal	1,595	153	85	58
	EXCEL 42 Smart Buffered CRT	995	96	54	36
	COLORSCAN 10 Color CRT	3,195	307	171	116
TELEVIDEO	910 CRT Terminal	650	62	36	24
	925 CRT Terminal	850	82	46	31
	950 CRT Terminal	1,075	103	57	39
NEC SPINWRITER	Letter Quality, 7715 RO	2,895	278	154	104
	Letter Quality, 7725 KSR	3,295	316	175	119
GENERAL ELECTRIC	2030 KSR Printer 30 CPS	1,195	115	67	43
	2120 KSR Printer 120 CPS	2,195	211	117	80
EPSON	MX-80 F/T Printer	745	71	42	27
	MX-100 Printer	895	86	48	32
TIMEPLEX	E0400 4 Channel Stat Mux	1,525	147	82	55
	E0800 8 Channel Stat Mux	2,050	197	110	74

FULL OWNERSHIP AFTER 12 OR 24 MONTHS • 10% PURCHASE OPTION AFTER 36 MONTHS

MICROCOMPUTERS
APPLE • COMMODORE • HP87 • DEC

ACCESSORIES AND PERIPHERAL EQUIPMENT
ACOUSTIC COUPLERS • MODEMS • THERMAL PAPER • RIBBONS • INTERFACE MODULES • FLOPPY DISK UNITS

TRANSNET CORPORATION
1945 ROUTE 22 • UNION, N.J. 07083 • (201) 688-7800
TWX 710-985-5485 800-526-4965 OUTSIDE N.J.

'How Are You Weathering the Recession?'

By Bruce Hoard
CW Staff

HOUSTON — A survey of National Computer Conference goers here last week revealed that they are weathering the current economic recession without suffering severe effects.

"We continue to expand based on our business," said Alfred R. Berkeley, senior financial analyst with the investment banking firm of Alex Brown & Sons in Baltimore.

Berkeley painted a rosy picture of his firm's economic landscape, saying that the company is in the midst of expanding all its DP operations. According to Berkeley, that expansion includes "massive" purchases and rewriting of economic software packages.

CW At NCC

Asked how the recession is affecting his company, Hyram A. Hall replied, "Not too much now and I think things are going to improve."

Hall is president of HAMC Corp., a consulting firm in Logan, Utah. He went on to say that people who buy computers still want follow-up support, but his "walk-in" business has slowed.

Nonetheless, Hall was optimistic, "We're bullish on America."

Jerry L. Falk reported no serious problems for his company, Microcom, Inc. of Norwood, Mass., which sells personal computers. "Things are still going pretty well." According to the senior designer, the availability of components also has improved.

Dennis L. Potter, senior planner with General Mills, Inc. in Minneapolis, said that his company has felt some impact from the recession. "Some of our major DP purchases have been shifted somewhat, timewise," he reported.

"We're pretty much just staying on track." Overall, General Mills is doing well, he added.

"It's been somewhat slowed," David Mayne said of business at Irvine, Calif.-based Printonix Corp. "Our company has been growing fairly rapidly in the past years and now it's slowed somewhat." The senior vice-president of Printonix's Business Development Division predicted a "continuing slow economy."

Even a corporate behemoth such as Gulf Oil Corp. is feeling the economic pinch. Dan White, senior engineer at Gulf here, said of his company, "It's affected as much as the oil economy is reduced," adding that these are not the best of days to be in the oil business.

Sylvia A. Nolanis is a programmer/analyst at Texas Eastern, another oil company headquartered here. The DP shop, as well as the company in general, is being held down by an "austerity program," she said.

Training and hiring have both been cut back. As she pointed out, in 1981, her department hired 12 people "and this year, we've hired one."

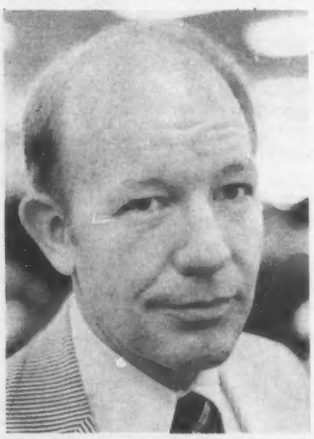
Sylvia A. Nolan, programmer/analyst, Texas Eastern, Houston

CW Photos by J. Bartimo

Dennis L. Potter, senior planner, General Mills, Inc., Minneapolis

Dan White, senior engineer, Gulf Oil Corp., Houston

Jerry L. Falk, senior designer, Microcom, Inc., Norwood, Mass.



Hyman A. Hally, president, HAMC Corp., Logan, Utah

David Mayne, senior vice-president, business development, Printronix Corp., Irvine, Calif.

MV/8000 vs. VAX • IBM • PE • SEL • PRIME

CAN YOU AFFORD TO CHOOSE THE WRONG ONE?

The "Detailed Analysis of the DG MV/8000" is a comprehensive, unbiased evaluation, carefully tailored to answer your questions in precise yet understandable language. It can help you decide if the MV/8000 is the correct system for your application.

- *Detailed yet unconfusing discussion of MV/8000 HW, SW and architecture*
- *Includes independently-compiled information not in any vendor literature*
- *Muckraking comparisons with DEC, IBM, PRIME, PE and Gould-SEL superminis*
- *Step by step configuration, conversion and cost analysis procedures*
- *Absolutely current — updated biweekly*
- *Subscription service available*
- *Over 200 pages beautifully bound with charts and illustrations*

The purchase price of this report is $150. (Free shipping in Continental U.S.)

48 Dewey Avenue
Mechanicville, NY 12118
Phone: (518) 664-2510

Telephone and mail orders welcome
NYS residents add state & local sales tax

COMPUTER CONSULTANTS' CONSORTIUM

The MT 212 D the right modem for you

Multi-Tech has a modem that gives you the speed you need at a price you can afford. Our MT212D is fully compatible with Bell and other 212A modems providing full duplex operation at 1200 bps over dial-up phone lines. Any modular telephone can be used, including the one you have at home. And at $695, the MT212D gives you real savings.

If you really need both 1200 and 300 bps, choose our MT212A modem. But if you're like most users, the MT212D is the right modem for you.

Compatibility and economy...the Multi-Tech MT212 modems. Please call or write for more information on these and other fine datacomm products.

MULTI-TECH

Multi-Tech Systems, Inc. • 82 Second Avenue SE • New Brighton, MN 55112
(612) 631-3550 • TWX 910-563-3610

OA Planners Urged to Cut Organizational Costs

By Robert Batt
CW West Coat Bureau

HOUSTON — A successful strategy to implement professional workstations in large corporations must include a drive to reduce organizational costs, National Computer Conference attendees here were told last week.

Speaking at a session on "Management and Professional Workstations," Paul Strassman, planning executive at Xerox Corp, said that unless office automation planners advertise and make use of their organizational experience they will be unable to bring down the cost of office workstations.

Strassman asserted that people in organizations constitute 40% of the cost curve of professional workstations. It was important, he claimed, for planners to have in mind an experimental model in which the notion of linguistics was important.

With professionals and managers turning in increasing numbers to multifunctional workstations as productivity aids, Strassman indicated there were hopeful signs for future development — in particular the rapidly decreasing costs of semiconductor components.

But he warned against introducing new technology for the sake of change.

"Productivity comes from using the machines, not from buying them; and vendors should have a humble view of what they can contribute."

The session was also addressed by Dennis McGuire of the Houston-based law firm of Andrews Kurth. Speaking on the planning and implementation of workstations, he argued that the choice of a local-area network should not be based on the terminal.

"Office automation requires thorough planning. Experimentation will flounder," he warned. Since office automation affects the whole organization, McGuire asserted that the plan should be evolutionary in nature with no grandiose amounts of money being spent initially for the formation of schemes that senior management will not believe.

CW at NCC

Exhibit Reviews Fortran History

By Marguerite Zientara
CW Staff

HOUSTON — For those with one eye on the past, IBM's 25th Anniversary of Fortran exhibit last week offered National Computer Conference visitors a look at a simpler technological age.

In a room located just off the main registration area, artifacts, photographs and a film told the story of those scientists and mathematicians whose early pioneering efforts changed the world of computing.

Working in a vacuum of knowledge — since no software benchmarks or other means of comparing performance existed — nine men and a woman developed Fortran at IBM.

Led by John Backus, who conceived the idea that led to a Fortran computer, the group lived "like a small family," said one of the pioneers.

Included in the IBM exhibit were early manuals and brochures, as well as the original documentation for Fortran. Among the original documents are Sheldon Best's Original Flow Diagram Section 5 and Fortran I Compiler, hand-written on eight pieces of yellow lined paper held together with adhesive tape.

A model of the operator's console and CPU of the IBM 704 electronic data processing machine, for which the first Fortran compiler was written, dominated the exhibit. Physically about the size of an IBM 3081 computer, the 704 contained at least 1,200 vacuum tubes but offered a fraction of the 3081's processing power.

The Mood of the Era, 1954-1960, was aptly conveyed by a display of photographs and one-liners such as: "Eisenhower, Churchill meet in Washington," "Joe McCarthy probes for Communists," "Willie Mays is home run leader," "Nasa established" and "Elvis emerges as rock star."

Lastly, "Fortran Today" highlighted 147 representative Fortran application manuals and presented the following bit of information: "A recent survey revealed that 90% of all computers used for engineering and scientific work — both IBM and non-IBM — use Fortran more than 70% of the time."

That Fortran has endured is unquestionable; that its development was a labor of love became apparent at NCC '82.

MIS

EXECUTIVE INSTITUTE

A Residential Executive Seminar, August 21-28, 1982, Telemark Lodge, Cable, Wisconsin

A residential program for MIS executives designed to build skills and develop state-of-the-art techniques in MIS management. The Institute provides an integrated and innovative approach to formulating a solid management strategy for the MIS department.

Designed for individuals moving into MIS and for MIS executives who wish to refresh, update, or formalize skills.

Focus is on integration of strategic and management issues, technology trends, managing MIS development, administration of computer facilities, legal liabilities and privacy laws, and forecasting.

Includes interaction with other MIS executives and top researchers and faculty in MIS from University of Minnesota School of Management. Faculty members include Professors Gordon Davis, Gary Dickson, Gordon Everest, James Wetherbe.

Carefully planned and designed to relate directly to the concerns of MIS executives.

15 years of study and practice of MIS management by the MIS Research Center ( ) Associate Firms and other national companies are incorporated into this Institute.

For more information please contact: Pamela Jensen, Executive Development Center, 324 Management and Economics, 271-19th Avenue South, Minneapolis, MN 55455; (612) 373-3837.
Because of the scope and nature of the seminar, enrollment has been limited to 35 participants.

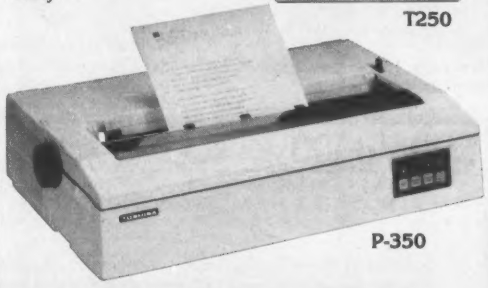
Sponsored by Management Information Research Center and Executive Development Center, School of Management, University of Minnesota, in cooperation with Continuing Education and Extension.
an equal opportunity educator and employer

We bring the best together with our fast new 3-mode printer

Advanced hardware and engineering by Toshiba. Innovative American software and strong sales support. Toshiba America combines them in easy-to-sell products with dealer prices and support tailored to help keep your competitive edge at its sharpest. Here is one example of our many advanced designs, shown with our T250 personal office computer.

P-350 LetterPerfect Printer
Our 3-mode prints letter perfect quality at 100 cps—twice as fast as the others. Prints 160 cps draft quality and its graphic capabilities are picture perfect! Our exclusive 24-replaceable pin printing head means easy, low cost maintenance. For full details, contact your nearest regional office today!

T250


P-350

THE BEST OF TWO WORLDS
TOSHIBA
TOSHIBA AMERICA, INC./INFORMATION SYSTEMS DIVISION

Corporate Office/Tustin, California/(714) 730-5000
Central Region/St. Louis, Missouri/David M. Johnson/(314) 991-0751
Eastern Region/Morristown, New Jersey/Albert J. Connelly/(201) 326-9777
Southern Region/Atlanta, Georgia/Michael J. Hutchinson/(404) 434-3891
Western Region/Irvine, California/Marvin McCurdy/(714) 540-5455

Keynote Speech

Olson Blasts H.R. 5158 as Anti-Competitive

By Phil Hirsch
CW Washington Bureau

HOUSTON — H.R. 5158, the rewrite of the Commnications Act of 1934 now pending in Congress, is being promoted as pro-competitive legislation, but actually is "one of the harshest restrictions of competition ever to be proposed," AT&T Vice-Chairman James E. Olson said last week in the National Computer Conference keynote address. Olson insisted that by making it "virtually impossible for us to compete, the bill would also deprive customers — and many suppliers like yourselves — of the benefits we can bring them."

Specifically, the AT&T official said, H.R. 5158 would "severely limit" customer options in securing telecommunications systems, "threaten the viability of the long-distance network," prohibit AT&T from offering services that integrate terminal and network facilities "and force those of you who are users of our long-distance services to continue subsidizing other companies that provide long-distance services in competition with us."

Underlying Olson's criticism was the assertion that the computer and communications industries have much more to gain from cooperation than from conflict and that the legislation will frustrate such cooperation.

Joint business ventures represent one form of such cooperation, he pointed out. "Unfortunately, H.R. 5158 would virtually prohibit this possibility. In brief, it would force your classification as a dominant carrier, and impose upon you all the regulatory restrictions that go with it, if you sought to join up with us in a business venture."

Another indication of what Olson called the "special relationship" between the computer and communications industries is that each is among the other's best customers. "Of the 30 segmented industries served by the Bell system, [the computer industry] accounts for the single largest part of our revenues from business customers — more than 5% of the total," Olson said. "The Bell system, on the other hand, is among your best customers."

CW At NCC

Although there is "little question about the oportunities this age holds out for our nation," foreign competitors are "working tirelessly to carve out a piece of the market — both here and abroad," Olson said. As a result, squabbles among domestic vendors of computer and communications services are likely to "sacrifice potential market shares." Instead of this squabbling, both industries should get on "with the business of doing what we know how to do best — serving customers through advancing technology."

CW Photo by S. Blakeney
James E. Olson

Papers Needed For NCC '83

HOUSTON — Even while this year's National Computer Conference was taking place, conference officials here were thinking about NCC '83, which will be held in Anaheim, Calif., next May 16-19.

The American Federation of Information Processing Societies, Inc. has issued a "Call For Papers, Panelists and Suggestions" for next year's extravaganza. The sponsors of the computer industry's largest annual show are seeking panelists, proposals for technical or panel sessions, ideas for topics, actual papers and suggestions for special activities.

Potential authors should send for the "Instructions to Authors." Videotapes, films or real-time demonstrations will also be considered.

The deadline for submission of proposals for technical or panel sessions is Sept. 1. The deadline for submission of papers is Oct. 10. Authors will be notified by Feb. 1 regarding acceptance.

All communications regarding NCC '83 should be sent to Allen N. Smith, Program Chairman NCC '83, Atlantic Richfield Corporate Systems, 515 S. Flower St., Los Angeles, Calif. 90071.

FINALLY, AN EXCUSE FOR NOT CALLING MA.

Codex's 5208R high speed modem is fully compatible with any Bell 208A/B type modem. Yet the 5208 offers some important advantages.

First, you can only rent from Bell. You can buy the 5208 outright. For only $1750. And if you should decide to lease from us, you'll build ownership equity.

Second, it offers better functionality by letting you grow from dial to leased line operation. The 5208R incorporates both the 208A and the 208B in the same box. Bell's modem does not.

So when Ma asks why you haven't called, just tell her you're trying to save money. And you'll end up with a great modem.

For any data communications problem, turn to Codex. The complete networking company. Call 1-800-821-7700 ext. 890. In Missouri, 1-800-892-7655 ext. 890.

codex
MOTOROLA INC.
Information Systems Group

Codex Corporation, 20 Cabot Blvd., Mansfield, MA 02048/Tel: (617) 364-2000/Telex 92-2443/Codex Intelligent Systems Operation, Tempe, AZ Tel: (602) 994-6580/Codex Europe S.A., Brussels, Belgium Tel: (02) 762.23.51/Codex (U.K.) Ltd., Croydon, England Tel: 01-680-8507/Codex Deutschland, Darmstadt-Griesheim, W. Germany Tel: (6155)-3055/Codex Far East, Tokyo, Japan Tel: (03) 355-0432/ESE Ltd., Toronto, Canada Tel: (416) 749-2271/Officers and distributors in major cities throughout the world. Member of IDCMA.

Teletel Videotex

VIDEOTEX 82
New York Hilton
JUNE 28-30, 1982
NEW YORK - N.Y.

Your French "rendez-vous" in New York

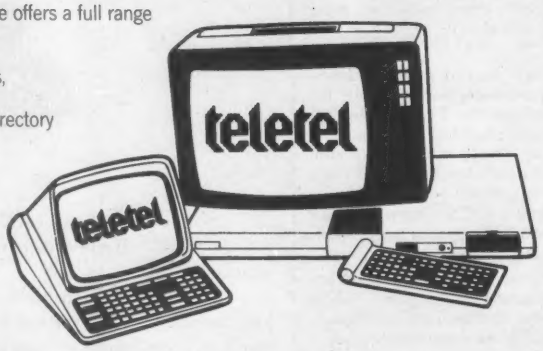
Designed for mass-market development, the French Telematique Programme offers a full range of Teletel-Videotex products and services:

- Personnal Terminals (Stand Alone Terminals and TV set adapters),
- Editing Terminals – simple on-line or intelligent with photographic facilities,
- Front end software and services for existing IBM and other hosts.
- Application software – documentary search, electronic mailbox, electronic directory tele-guides, etc.

Teletel-Videotex products combine central Videotex host databases with remote access to existing databases (using the Distributed Gateway Structure) and have the unique capability of combining low cost Terminals with Smart-card peripheral readers for identification encryption and telepayment procedures.

Teletel-Vidéotex: the proven technology available now with a wide range of options to match every application.

Visit INTELMATIQUE, to take full advantage of this opportunity to avoid "re-inventing the wheel" in your modernization plans.



Intelmatique
FRANCE

THE ORGANIZATION FOR THE INTERNATIONAL PROMOTION OF TELEMATIQUE

98, rue de Sèvres 75007 PARIS. Tél. : (33) 1 306.16.36, Télex 203185 TELEMAT. F.

PROVO

Foreign Visitors' Concerns Hit Close to Home

By Catherine Marenghi
CW Staff

HOUSTON — Why would a DP manager make the 22-hour trek from southwest Australia to attend the National Computer Conference? And why would other computing professionals from as far away as Cyprus, Singapore, Uruguay and Tunisia invest the time and expense to come here last week?

A sampling of comments from international attendees at NCC indicates that although their origins are distant and diverse, their reasons for attending strike close to home.

"We are looking to speed turnaround of software development," commented David Clarke, information systems director for Cliffs Robe River Iron, Perth, Australia. "We are spending less on hardware and want to squeeze more for our money out of software."

To that end, Clarke is hoping to learn more about fourth-generation languages, new application system development methodologies and prototyping at the technical sessions here.

"We are reaching the law of marginal returns," according to Roberto Alvarez, DP and telecommunications director with Finalven, a Venezuelan financial holding company. "To keep profits up, we have to keep the employee population down." Alvarez is looking to new developments in office automation and telecommunications to reduce clerical staff costs and improve productivity.

Another Venezuelan attendee mirrored Alvarez' concern for productivity. Norberto Calderas, DP and telecommunications manager for Pequivin Co., a Caracas-based petrochemical firm, stated, "In a highly competitive field, we have to meet competition head-on."

One West German attendee pointed out that learning, not shopping, is the concern of the majority of foreign attendees. Because of export restrictions, "Buying is problematic," according to Wolfgang Heinecke, DP manager for Max Planck Institut. Heinecke's particular interests are new trends in operating systems, microcomputers and image processing.

CW at NCC

Vendors Vie For Attention

By Jeffry Beeler
CW West Coast Bureau

HOUSTON — This year's National Computer Conference again demonstrated the lengths that some vendors are willing to go to lure prospective customers to their exhibits.

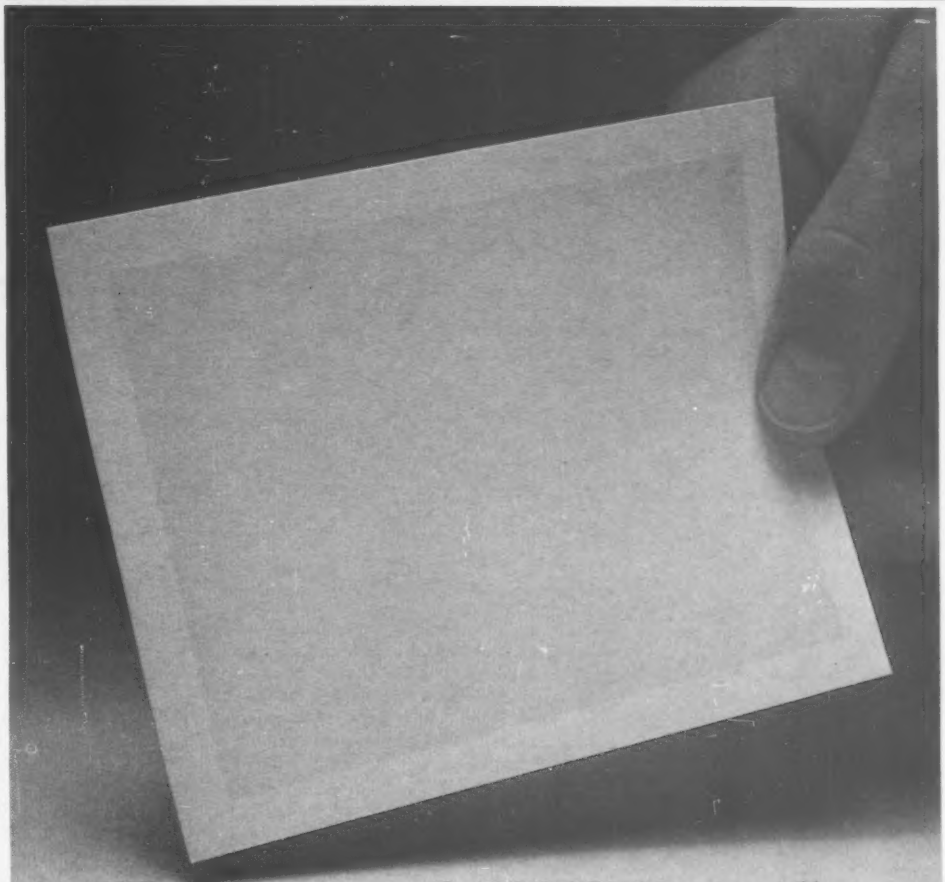
As in past years, exhibitors at NCC '82 relied as much on showmanship and gimmickry as on high technology to win the quiet but intense struggle for show-floor visibility.

Perhaps typical of the crowd were companies like Megadata Corp., which this year built its NCC advertising effort around a mobile, wisecracking robot. The company, which exhibited a line of 16-bit terminals, appeared to have borrowed the robot idea from a well-known industry trade publication, which has often used a similar gadget.

Steelcase, Inc. — a supplier of workstations for automated-office users — also populated its product booth with "robots." But unlike their Megadata counterparts, which were mechanical, Steelcase's were human.

Joining the robots, both mechanical and otherwise, on the NCC '82 show floor were a raft of more conventional advertising gimmicks, including pitchmen and "theme" exhibits.

Lear-Siegler, Inc., for example, recreated a "Wild West" frontier town, complete with a blacksmith shop, dry goods store and fake water tower, to promote the company's new color terminal and vector-drawing option.



Here is a picture of a WINC™08 controller as seen from your DEC computer.

Our WINC08 controller is completely software transparent to DEC's RL02, so your PDP-11 or LSI-11 computer won't even see it! And while this Q-Bus®/UNIBUS® compatible controller will be totally invisible to your computer, the advantages of using it will be *immediately visible* to you.

For PDP-11 or LSI-11 users.

For LSI-11 users.

For instance, when teamed with our dual 8-inch Winchester disk drives, WINC08 offers up to 41.6 megabytes of storage capacity in a DEC "look-alike" enclosure just 5¼ inches high. The result? With WINC08, you get four times the storage capacity of DEC's RL02 in one-eighth the space!

For LSI-11 users who want the flexibility of an 8-inch Winchester combined with an 8-inch dual-headed floppy disk, there's the WINC08/F controller. It provides emulation of both the RL02 and RX02 in a single 5¼-inch high enclosure!

Both the WINC08 and WINC08/F controllers offer the highest throughput available. Maximum data reliability. Unique on-board self-test capability. And the best price-to-performance ratio in the industry!

Now you can add storage capacity and increase the efficiency of your DEC system in the bargain. And we'll deliver your choice of a dual Winchester, or Winchester/floppy combination in just thirty days. Either way, you'll see a big difference, even if your computer doesn't see a thing!

To order – or for additional information – call or write us today. Advanced Electronics Design, Inc., 440 Potrero Avenue, Sunnyvale, CA 94086. Phone 408-733-3555 TELEX 357-498.

Sales Offices: LA 213-907-8811/ Detroit 313-352-4290/New Jersey 201-238-6322/Boston 617-256-1700.

® Reg. trademark of Digital Equipment Corp.
™ Trademark of AED.

ADVANCED ELECTRONICS DESIGN, INC.

Visit us at Comdex. Booth #1161

Sponsors of the U.S. Pavilion, 1982 World Fair.

Panelists Cite 'Subtle Discrimination'

ERA or Not, Tough Role Seen for Women in DP

By Lois Paul
CW Staff

HOUSTON — Whether or not the Equal Rights Amendment (ERA) is passed, the equal rights issue is going to impact women data processing professionals.

This is how Dr. Caroline Eastman of the Department of Mathematics and Computer Science at Florida State University introduced the panel discussion entitled "Life After ERA, Women in the Work Place in the '80s" at the first annual conference of the Association for Women in Computing, held here last week the day before the National Computer Conference opened its doors.

Eastman noted that the U.S. is the only large industrialized society that does not have legalized equality for women. "We chose this topic regardless of what happens with ERA," she said, because even if it is passed women will be "dealing with subtle forms of discrimination rather than the blatantly locked doors of the past."

The panelists described the roadblocks that face women in the scientific and computing professions. One problem is the educational process in which little girls start out in elementary school on a par with boys with relation to math. As they progress to higher grades, however, their interest falls off.

Dr. Nell B. Dale of the University of Texas at Austin attributed much of this to socialization. She described an encounter with her daughter's second grade teacher, who replied to her questions about the child's math ability with "Oh, I don't pay attention to little girls and their arithmetic."

"I don't think that is uncommon," Dale said.

When they get past the educational process, women often face career interruptions that can make them out of date in terms of their professions.

Because of this, the University of Texas at Austin has undertaken a project that is being funded by the National Science Foundation to help women reenter jobs in scientific fields. The first phase of the project is education "to undo what the unthinking second grade teacher does to your children," Dale said, explaining that this phase includes career days in which female mathematicians participate along with male professionals in this field.

The second phase is direct intervention to determine where the women science professionals are and to upgrade the skills of women reentering this field.

Beginning in 1976, the Computer Science Department at the Universi-

CW At NCC

ty of Texas has sponsored a reentry program in which women with natural or social science degrees spend about a year completing 15 to 18 hours of computer science courses.

The job prospects for graduates of this program have been bright, she explained, noting that IBM said their training and people skills make them "marvelous employees."

In addition to her school's program, Dale offered the following advice to women who face career interruptions: join professional associations, including the PTA, if necessary; don't sit at home and vegetate; go to graduate school part-time; and read journals.

Alyce Jackson, Ph.D., who recently formed her own company, Technology Research Laboratory, stressed the importance of maintaining the spirit inherent in the report of the National Women's Conference held in Houston five years ago. "I think the momentum pushed forth at that conference has been pushed forth with great intensity," she said.

The key to continuing this spirit and working toward top jobs is to form strong networks, learn the rules of the corporate game and play it well, she said. "We must become friends and help each other."

Janice Knapp-Cordes, a mathematician with the Scientific Computing Division of the National Bureau of Standards, described her division's efforts to encourage young women to enter careers in mathematics, as well as to kill a lot of the stereotypes about women in these professions.

DEC

VT-131	new	$1250
LA-36	used	$350
LS-120	used	$795

LSI BOARDS-PDP MODULES NEW PRICED TO SELL

TI 745	used	$595

TBC Terminal Brokers Co. 2001 West Main St. Suite 304, Std., CT 06902
203-964-9331

BEFORE WE DESIGNED WE LISTENED.

Here's what we learned. You want what a computer can do...without spending a lot of time learning to make it do it. You told us you wanted a business system that was easy to learn and use. So, we designed BMC's to be business systems... part of the solution, not part of the problem.

You wanted simplicity. Business computers that did more, so you could do less. And, you wanted them all in one unit. Not a gaggle of wires and boxes. That's why we built everything into single, desktop units. All-in-one: The computer, keyboard, display screen, mass memory... and right behind the keyboard, a work-printer to print out whatever you're working on.

You wanted a business machine. A machine virtually everyone in the office could use. So, we added easy to understand and use, yet highly effective programs. Programs that mean you'll spend more time thinking about the business and less time thinking about the computer.

For everything. When you buy a BMC Business Computer, you get word processing that most people can learn in 90 minutes. Another program that gives you forecasting and "What if...?" modeling. Plus others that include file and data management. More good news: There are over 2,000 other user programs available for the BMC systems.

You wanted clarity. The person who said, "One picture is worth a thousand words," was thinking about pictures in color. Things are clearer in color. Charts. Graphs. Business information of all kinds. Profit in green, loss in red, for instance. In business, color can mean the difference between confusion and understanding. That's why we built it into BMC Business Systems.

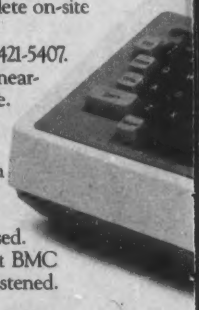
Plug-and-go. Many BMC programs will be available in plug-in cartridges. Which means they'll be as easy to load as a video game machine. But you won't be playing games with them.

Growing? Great. BMC Computer Systems will grow with you. Add a letter quality printer. Add electronic mail capabilities. Or, a host of other accessories. Even, additional workstations. And here's a pleasant thought: We'll be there when you need us. BMC Business Systems are manufactured by a company that's been around for 103 years. And they're planning their bicentennial.

Service, if you need it. A nationwide field service organization offers complete on-site customer service for BMC.

Toll-free information: Call (800)421-5407. We'll tell you the name of your nearest BMC dealer or representative.

Ask your own questions. We asked you. Now ask us. Ask your BMC dealer the tough questions. Utility? Ease-of-use? Performance? And of course, price. You'll be pleasantly surprised. Because before we built BMC Business Systems, we listened.



BMC

BUSINESS MICROCOMPUTER DIVISION
OF TECHNOLOGY GROUP, INC.
860 East Walnut
Carson, CA 90746
(213) 323-2600

'We Have a Long Way to Go': AWC Keynoter

By Lois Paul
CW Staff

HOUSTON — "We have a long way to go, but we have our foot in the door."

With these words, Thelma Estrin, Ph.D., a professor of engineering and computer science at the University of California at Los Angeles, began her keynote address at the first annual Association for Women in Computing (AWC) conference here last week.

The meeting was planned to coincide with the 1982 National Computer Conference.

Estrin recalled a session she chaired at NCC in 1978 entitled "Designing and Debugging Careers for Women in the Data Processing Industry."

Noting that she recently reread the session abstract that was included in the proceedings, Estrin reported "there probably isn't another paper in that proceeding that could be said to be the same four years later."

CW At NCC

Estrin outlined some major obstacles women encounter in their attempts to get to know the organizational environment and political structure in which they operate. "You can move through the first few steps, but as you go higher, the obstacles become much more difficult," she said.

Among the problems she noted were:

- Establishing a professional and technical identity. Women need to be taken seriously, but one of the first questions they always are asked is not what their job is, but whether or not they are married.
- Establishing visibility. "Many people think women should be seen and not heard," Estrin said, explaining that they often are outshouted at meetings.
- Battling patronizing behavior. "Even when somebody accepts you, he may want to do too much for you."
- Proving they have qualifications. "Many people think women are there because of affirmative action and that they are not really that good," she said.
- Fending off unwanted sexual attention. Estrin said her daughter has received obscene electronic mail while working at a terminal at a university computer center.
- Being subject to inappropriate interpretation of their behavior. As an example, Estrin said, when a man goes out to lunch with the boss, it is assumed he is "on his way up." When a women goes out with the boss, it is assumed they are having an affair.
- Dealing with comments on their appearance. "Sometimes it gets to be too much," she said.

CW Photo by L. Paul
Dr. Thelma Estrin

THE BMC COMPUTERS,

Women DPers Hold First Meet

By Lois Paul
CW Staff

HOUSTON — Although the group was small, interest and participation were strong at the first annual conference of the Association for Women in Computing (AWC), held here last week.

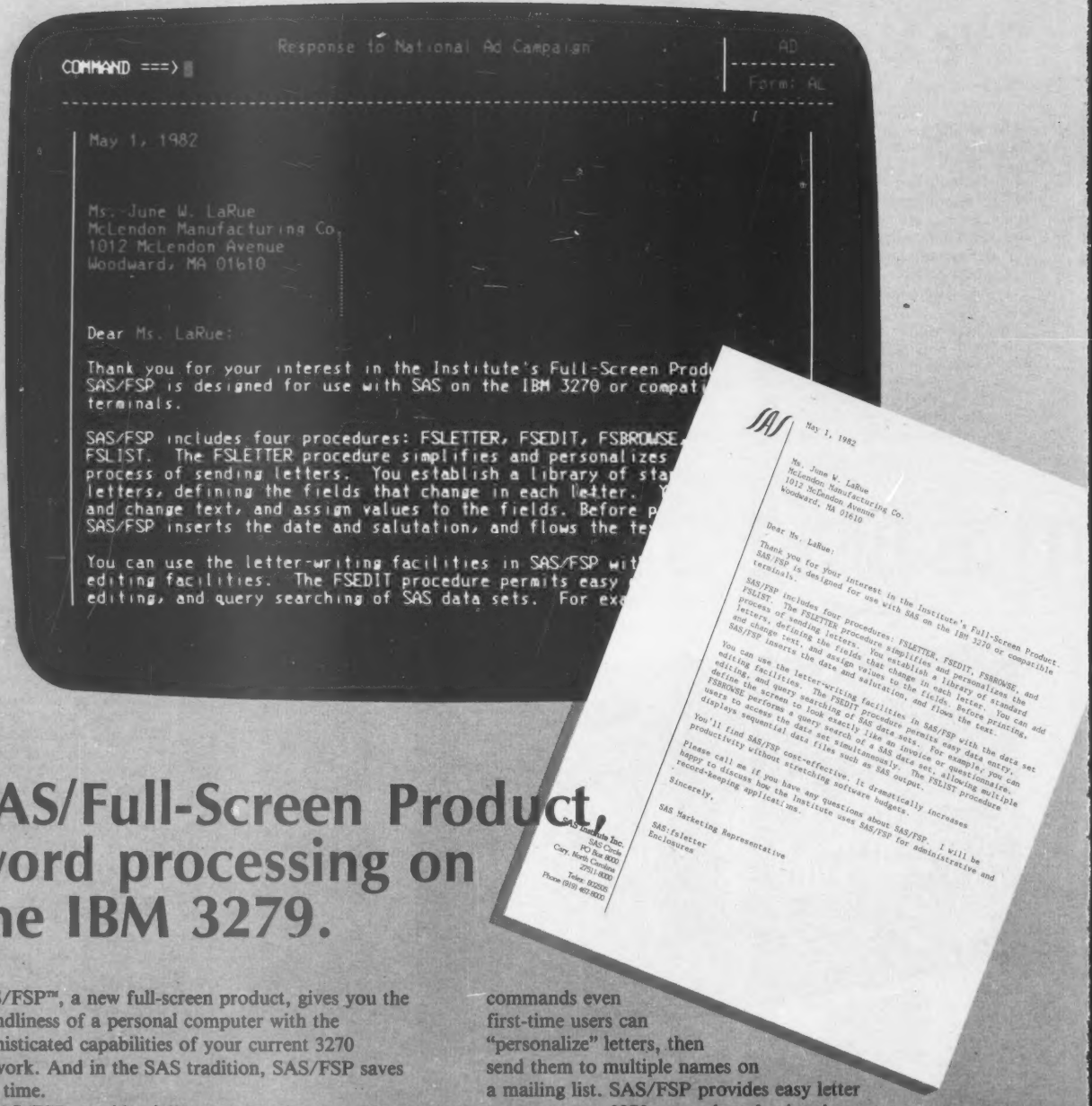
"As a rule, I think that first annual conferences from any organization are not heavily attended," Linda Taylor, president of AWC, told the approximately 50 attendees who met the day before the National Computer Conference officially opened.

Taylor blamed late publicity for the small turnout, but predicted that a larger crowd will attend next year's conference, which is again scheduled to coincide with NCC in Anaheim, Calif., in May of 1983.

At the conference, AWC presented its first award for service to women in the field of computing to Thelma Estrin, Ph.D., professor of engineering and computer science at the University of California at Los Angeles (UCLA) and a member of the UCLA Brain Research Institute. Estrin "has been a pioneer, and it is never easy to be a pioneer," Taylor said.

Taylor indicated that AWC plans to reexamine its purpose during the next 12 months.

For example, although AWC sees itself as providing professional development for women, "perhaps we cannot do it and are setting ourselves up to fail," she said.



SAS/Full-Screen Product, word processing on the IBM 3279.

SAS/FSP™, a new full-screen product, gives you the friendliness of a personal computer with the sophisticated capabilities of your current 3270 network. And in the SAS tradition, SAS/FSP saves you time.

SAS/FSP provides full-screen data input, editing and retrieval operations, freeing your staff from tedious error-correction and needless repetition. To these facilities SAS/FSP adds a letter-writing and editing procedure. You establish a library of standard letters. SAS/FSP inserts the date, name, address and salutation automatically. With a few simple commands even first-time users can "personalize" letters, then send them to multiple names on a mailing list. SAS/FSP provides easy letter entry on your 3270 network and prints letters on the IBM 6670 or 3800, Xerox 5700 or 9700 and all line printers.

Best of all you can use these sophisticated letter-writing facilities with the data management, analysis and reporting capabilities in SAS®, providing a smooth flow of information between data processing and word processing.

SAS products run on IBM 360/370/30xx/43xx and compatible machines, in batch and interactively under OS, OS/VS, VM/CMS, DOS/VSE and TSO.

SAS Institute Inc., SAS Circle, Box 8000, Cary, NC 27511 USA. Phone (919) 467-8000. Telex 802505.

SAS Institute GMBH, Rohrbacherstrasse 22, D-6900 Heidelberg 1, West Germany. Phone 06221-29014.

SAS Software Ltd., The Centre, 68 High Street, Weybridge, Surrey KT13 8BL, UK. Phone 0932-55855. Telex 8954665.

SAS Institute (NZ) Limited, PO Box 10-109, The Terrace, Wellington, New Zealand. Phone (4) 727-595. Telex 31525 MEDICO.

SAS Software Pty. Ltd., GPO Box 4345, Sydney, NSW 2001, Australia. Phone (612) 238-2187. Telex 72566.

SAS saves time.

SAS is the registered trademark of SAS Institute Inc., Cary, NC, USA. SAS/FJP is a trademark of SAS Institute Inc. Copyright © 1982 by SAS Institute Inc.

Automatic Conversion Of Data Bases Advocated

By Lois Paul
CW Staff

HOUSTON — Automatic conversion of data bases and a higher language interface to data base machines were among the "Topics in Data Base Systems" discussed during one session at the National Computer Conference here last week.

The session moderator, Glen Thomas, professor of administrative science at Kent State University, presented the paper he co-authored with Ben Shneiderman of the University of Maryland titled "Automatic Data Base System Conversion: Schema Revision, Data Translation and Source-To-Source Program Transformation."

"I am here as an advocate for this approach," he said, noting that he tried to develop a model of a data base system rather than a data base management system. He described this system as a combination of software and the programs existing in a particular environment.

The data base includes the facts pertinent to the particular organization that can be accessed by batch and ad hoc on-line programs, Thomas explained. How the data values are interrelated is the schema.

Schema Models Environment

The schema basically models the environment of the organization, he said. As this environment changes, the problem becomes how to change to another system that the same programs can access. To do this, Thomas' approach defines a sequence of transformations to translate the old schema so it will be usable by programs accessing the new schema.

"The two data base systems will be equivalent if the user cannot tell which one has been queried because the response is identical," he said.

Called the Pure Transformation Language, Thomas' approach is based on a Codasyl DBTG model variant. It includes 13 transformations that should be supported, such as Change Name, Add/Remove Field, Append Field to Key of Set and Detach Field From Key of Set.

With this approach, Thomas hopes it will be possible for the data base administrator to revise existing data base systems periodically and to shift most of the work involved in this process to the automatic transformation system rather than involving people.

S.B. Yao of the Data Base Research Center at the University of Maryland discussed "Data Language Requirements of Data Base Machines." This involved his work on designing an interface for a back-end data base machine with a front-end host processor.

The importance of a high-level data base machine language interface, according to Yao, is to enable data base machine support of various types of front-end processors, to improve the efficiency of processing for both front-end and back-end processors and to minimize the number of communications between the front-end processor and the data base machine, he explained.

The requirements for this interface language are completeness, efficiency and flexibility, simplicity of high-level operations in the front-end processors and extensibility so it can support any future data model.

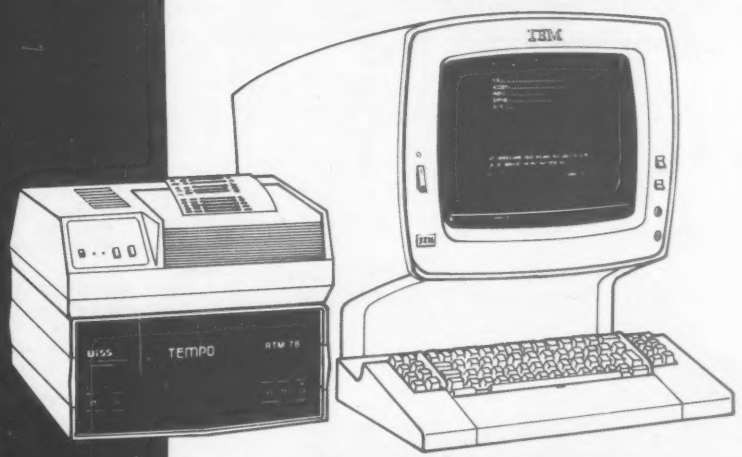
One approach Yao described employed Extended Query Language, which, he said, is compatible with IBM's SQL/DS as an interface language to Britton-Lee, Inc.'s IDM-500 relational data base machine.

CW At NCC

CW Photo by S. Blakeney

Lights, Cameras, Action!

Finally...True Response Time Measurement For 3270 Networks!



TEMPO™ Response Time Monitors:

- Measure the actual time an IBM 3270 terminal is unavailable — the minutes(!), seconds, 10ths, 100ths between hitting the enter key until the keyboard unlocks
- Build a data base of actual response times by time of day; summarize the data; construct histograms — and — print the data; display it; and receive it at the host computer
- Operate in all IBM environments — SDLC, Bisync, SNA and local protocols — under VTAM, TCAM, and BTAM telecommunications access methods
- Are easy to install — reliable — and — TEMPO proves what's really happening at users' terminals

TEMPO™ With TEMPO you can optimize network performance and productivity

15 Day Free Trial Offer

☐ Yes, I am interested in TEMPO Response Time Monitors.
☐ Please send me _____ unit(s) for my 15 day free trial. I have attached a Purchase Order for $2,850 for each unit. If I return the unit(s) before the end of the 15 day trial, I will pay only shipping charges.

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
TELEPHONE _____

Number of model 3270 type terminals installed _____ model(s) _____
☐ Please have a salesman call. ☐ Please send more information.

Send to: TEMPO Department 201, DTSS Incorporated, 10 Allen Street, Hanover, NH 03755 ■ Telephone (603) 643-6600, Ext. 628

DTSS A Subsidiary of Metropolitan Life Insurance Company
With offices in: Orange, CA Scottsdale, AZ Hartford, CT Woodbridge, NJ Chicago, IL

SAVE UP TO 50%

On IBM Installation or Deinstallation

LET OUR EXPERTS HANDLE YOUR IBM 370/303x SYSTEM AND YOU'LL...

SAVE *SAVE* *SAVE*

Guaranteed IBM Maintenance Acceptability

3033 FEATURES AVAILABLE

3851 Extended Channels 3033S
3851 Extended Channels 3033N
S2N Upgrade
N to U Upgrade
3868 Buffer Expansion
6850 Systems Extension
4850 Datastreaming

Call us today
CIRCLE COMPUTER SERVICES, INC.
312-884-2424 920 Remington Rd. Schaumburg, IL 60195
offices in Tokyo, Japan and Surrey, England

A Rock-Solid Guarantee for IBM 370/303X cpAIMS Add-In Memory!

Computer Products Marketing is confident its cpAIMS add-in memory for IBM 370/303X systems is better than IBM's own memory. So confident, in fact, that we offer a rock-solid guarantee to replace our add-in memory with IBM memory if you are not completely satisfied.*

At CPM, with memory field experience equal to IBM's, we have good reason for this confidence. The cpAIMS add-in memory has four times the density of IBM's memory card. Yet, it costs approximately half as much. The cpAIMS memory also offers plug compatibility and is completely transparent to IBM 370/303X systems.

In addition, CPM can custom-tailor a lease, sales, or lease/option plan to your individual needs.

These are just a few of the advantages of the cpAIMS add-in memory. Call to find out more about our add-in and add-on memories. You'll discover why we're willing to chisel our guarantee in stone.

For more information call Tony Coppola or Chuck Williams today!

cpAIMS Is The Joint Memory Product Of:

CPC Both Formerly EMM CPC Division — CPM

(213) 777-4070 (213) 754-8502

P.O. Box 36 • 12624 Daphne Avenue • Hawthorne, CA 90250

*Details of Rock-Solid Guarantee available from CPM Sales Representative

Use of DSS in Government Termed a Tough Challenge

By Jake Kirchner
CW Washington Bureau

HOUSTON — Implementing a decision support system (DSS) in government "is not different from the private sector, but is more of a challenge," Dr. Peter G. W. Keen of MIT's Sloan School of Management said at a National Computer Conference session he chaired last week.

Keen and his fellow panelists reported on their experiences in developing a DSS for policy analysis in APL, which is now used by six state governments under the name Interactive Support System for Policy Analysis and is about to be offered commercially.

Although designing a DSS for a government may be more complex because of the convoluted political relationships and increased public exposure involved, Diane Wilson, of the Harvard University School of Education, stressed the importance of understanding the particular environment of any planned DSS implementation.

"People tend to go in somewhat unaware of what they're involved in and unaware of the procedures and rules," she observed.

Preimplementation Planning

Preimplementation planning by someone familiar with the organizational environment is needed, she said, to:

- Provide a clear and concise understanding of the power structure.
- Identify the kinds of work that will be affected.
- Identify the key individuals, whose support for implementation is vital.
- Determine what procedures must be changed to facilitate the DSS implementation.

In general, she said, DSS planners need to find out "what [organizational] procedures stand in the way of implementation and what procedures help in the process."

In addition, she said, planners need access to and the support of the key individuals. Without that, she explained, "you are going to be isolated and the technology is going to be isolated.

"Software technologies pose significant threats to existing power structures," she noted, saying DSS designers need "a pretty good understanding of what the motivations are to implement" a new system.

CW At NCC

To facilitate the planning process, Gloria Bronsema, also of Harvard, told the session that DSS designers can develop "snapshots" of the organization by interviewing people at all levels of the planned implementation.

Bronsema noted there is a difference between installation, which involves technology, and implementation, which involves people. The interviews can reveal the level of support for the DSS project, the existing work environment, the prospective users' ideas on expected DSS problems and benefits and the amount of user education that will be necessary for successful implementation.

This information is "valuable later in selling the system," she said. It also helps to define the users and identify the key decision makers and provides the basis for an implementation strategy. Perhaps most important, she added, the interviews help identify "sources of conflict and potential surprises."

Medical DSS Development Seen Difficult, Inefficient Process

By Jeffry Beeler
CW West Coast Bureau

HOUSTON — Decision support systems (DSS) have gained only limited acceptance thus far among physicians, and development of medical DSS remains a "difficult and inefficient" process.

That opinion was expressed here at the National Computer Conference by Dr. James Reggia, a University of Maryland computer scientist and expert on artificial intelligence.

Speaking during a technical session at NCC, Reggia cited three main reasons for the medical community's widespread resistance to DSS technology:

- Doctors remain unconvinced that the systems are useful.
- DSS often prove difficult to transfer effectively from one treatment setting to another.
- Development of such systems is both costly and time-consuming and requires a major interdisciplinary effort involving medical and computing experts alike.

In an effort to overcome these common obstacles to acceptance, Reggia and his University of Maryland colleagues have devised a DSS development aid that reportedly uses high-level languages to turn medically oriented knowledge bases into finished DSS.

Known as the Knowledge Management System (KMS), the facility was designed to simplify the task of DSS development and is aimed primarily at users who know a lot about medicine, but have little expertise in computing, Reggia said. The system is geared strictly for research and is not being made available commercially, he said.

Reggia described KMS as "a bit different from the common approach" to DSS development. One of the system's most distinguishing features is its ability to "do an electronic double take," he said. Unlike more conventional DSS development methods, KMS is able to reformulate its diagnostic hypotheses if it encounters a patient symptom that conflicts with its existing medical knowledge. The system also boasts the unusual ability to juggle multiple medical conditions simultaneously, Reggia said.

. . . the one weekly newspaper that's designed to fulfill your unique "need to know". . . the one newspaper that can give you all the current information you need to benefit you, your organization and your career progress . . . 52 weeks of incisive news, commentary and special reports . . . subscribe today, use the attached postage paid order form.

COMPUTERWORLD

☐ Please enter my subscription
(details on back)

☐ I'm already a subscriber, but I'd like you to change my:
- ☐ address
- ☐ title
- ☐ industry
- ☐ other

My current mailing label is attached and I've filled in new information on the other side.

Put old label or label information here

Please send me COMPUTERWORLD for one year. **RATES: United States $36; Canada, Central & South America $110; Europe $165; All Other Countries $245 (Airmail Service)**

☐ Check Enclosed
☐ Am Ex ☐ BA/Visa ☐ MC (MC Only - List four digits above your name)

If charge we must have cardholder's signature: _____ Expiration Date: _____

First Initial	Middle Initial	Surname	
Your Title			
Company Name			
Address			
City		State	Zip Code

Address shown is:
☐ Business
☐ Home

☐ Check here if you do not wish to receive promotional mail from *Computerworld*.

☐ Check here if you're interested in receiving information on *Computerworld*'s Index.

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

BUSINESS/INDUSTRY
10 Manufacturer of Computer or DP Hardware/Peripherals
20 Manufacturer (other)
30 DP Service Bureau/Software/Planning/Consulting
40 Public Utility/Communication Systems/Transportation
50 Wholesale/Retail Trade
60 Finance/Insurance/Real Estate
70 Mining/Construction/Petroleum/Refining
75 Business Service (except DP)
80 Education/Medicine/Law
85 Government - Federal/State/Local
90 Printing/Publishing/Other Communication Service
95 Other _____

TITLE/OCCUPATION/FUNCTION
11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/ Administrative Service
22 Director/Manager/Supervisor DP/MIS Srvs
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other: _____

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

CIRCULATION DEPT. 375 Cochituate Road, Rte. 30, Box 897, Framingham, MA 01701-9985

Detach here, fold, and place in post-paid envelope attached through binding.

The Personal Mainframe has everybody talking.

Most people think only small computers are personal. But Digital makes a big computer that's personal. And The Personal Mainframe™ computer has a lot of people talking:

"It has the capability of a very large computer with the flexibility of a minicomputer." President of a commercial timesharing company.

"People found it so easy to use, they just went wild over it—we were doing five times the anticipated workload in just four months." DP manager for a Houston-based chemical company.

"Its easy control language and compatibility with other interactive computers allowed us to develop more applications at less cost." Senior Engineer for a government aerospace project.

"When we switched from batch to The Personal Mainframe, the productivity of our programmers went up easily 50%." Director of Computer Services for a state Office of Education.

"We were impressed with the flexibility. It can handle a wide variety of scientific, administrative and financial data processing programs." Controller for a major engineering company.

"It lets us combine both scientific and commercial files into one powerful data-base." MIS manager for a communications equipment manufacturer.

"We switched to The Personal Mainframe for an interactive approach. It was more cost effective and it made production of reports a lot easier." Vice-President for a New York financial consulting firm.

There are two kinds of Personal Mainframes to choose from: the DECsystem-10 and DECSYSTEM-20. If you'd like to find out what they can do for your company, send for our brochure. "The Personal Mainframe and how to know if you need it." Or call us at 617-467-6434.

You'll find we have something worth talking about.

Digital Equipment Corporation, 201 Forest St., Marlboro, MA 01752. European Headquarters: 12 Av. des Morgines, CH-1213 Petit-Lancy/Geneva. In Canada: Digital Equipment of Canada, Ltd.

digital

We change the way people work.

Detach here, fold, and place in postpaid envelope attached through binding.

CW Photo by S. Blakeney

Cooling Their Heels at NCC

Encryption Needed

You Can't Prevent a Tap: Experts

By Jake Kirchner
CW Washington Bureau

HOUSTON — One of the more popular National Computer Conference sessions last week was on protecting data communications lines, but the audience seemed much more interested in the speakers' mini-lesson in compromising communications security.

Demonstrating the ease with which telephone lines can be tapped and data transmissions intercepted, session leaders J. Michael Nye, president of Marketing Consultants International, Hagerstown, Md., and Rob O'Conner of Motorola, Inc. used a variety of radios, tape recorders and portable units to prove O'Conner's claim that "It's impossible to prevent a tap from being made."

The session participants argued for the position that data encryption is the only prudent recourse for organizations wishing to protect their communications.

Unfortunately, Nye said, there is very limited use of encryption today. He cited a survey his firm did of federal government offices in the Washington, D.C., area. The survey identified more than 9,000 government facsimile machines, transmitting about 68,000 pages a day; of those machines, only 254 provided any data encryption capabilities.

Similarly, the company found almost 300 communicating word processors, sending a total of 13,000 messages a day; of those, more than 99% were unprotected from interception.

O'Conner offered the usual scare statistics on computer crime — the billions of dollars worth of crime undetected or unreported, the millions of small computers in use today and the wide variety of people out there — from disgruntled employees to foreign spies — who might try to intercept private communications.

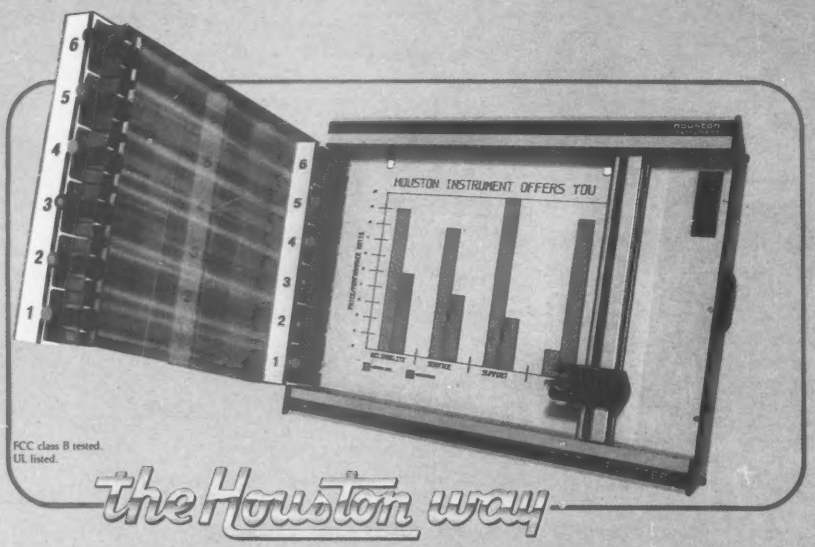
To demonstrate his argument about the vulnerability of modern communications systems, Nye intercepted randomly mobile radio telephone calls on an inexpensive model of the popular scanning radios. With the increased use of microwaves for transmission of telephone calls, anyone can listen into thousands of calls over a wide geographic area and use a computer to monitor lines of particular interest, he said.

To tap cable-based transmissions, O'Conner showed, a wireless microphone could be used to intercept a data transmission and send the information to a cassette recorder that was some distance away. O'Conner held a cassette recording from a data message against the acoustic coupler of a Texas Instruments, Inc. Silent 700 terminal, which promptly printed out the intercepted message.

There are just too many places on a cable link to prevent a tap from being placed, according to O'Conner. But use of the National Bureau of Standards' Data Encryption Standard to encipher a message would make it impossible to understand the data, he noted.

CW At NCC

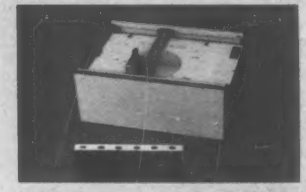
New from HIPLØT™ multi-pen plotting for as little as $1480*.



FCC class B tested.
UL listed.

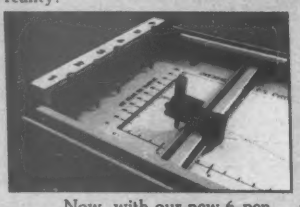
the Houston way

The new HIPLØT DMP Series 6-pen option makes high performance multi-pen plotting affordable. It's available on the DMP 2, 3, and 4 models in the HIPLØT family so you can enjoy the advantages of multi-colored plots on 8½" × 11" (DIN A4) surfaces. Of course, you also get the standard HIPLØT range of capabilities such as intelligence, controls, interfaces and resolutions. There's a model for virtually every plotting application.



Big Performance in a Small Plotter

Since it's introduction, the HIPLØT DMP Series has been recognized as the innovative plotter line which made low-cost, high performance digital plotting a reality.



Now, with our new 6-pen option, there's an exciting new dimension in the DMP Series' versatility. Imagine two standard models with RS-232-C and parallel interfaces, four intelligent models with RS-232-C or Centronics®-compatible interfaces, a choice of controls, resolutions, and pen speeds. Add to this the ability to plot with 6-pens on paper, vellum or mylar (ideal for overhead projectors) and you have the ultimate plotter price/performance combination — the perfect choice for the user or OEM.

8-Pen Models Also Available.

If you need a little more capability, take a look at our new 8-pen option. It's available on the DMP 5, 6, and 7 so you can have 8-pen multi-colored plots on 11"×17" (DIN-A3) surfaces.

Why wait? Let us send you complete information on this breakthrough in **affordable, multi-pen plotting.** *Contact Houston Instrument, P.O. Box 15720, Austin, Texas 78761. (512) 835-0900. For rush literature requests, outside Texas, call* **toll free 1-800-531-5205.** *For technical information ask for operator #5. In Europe contact Houston Instrument, Rochesterlaan 6, 8240 Gistel, Belgium. Phone 059/27-74-45.*

INSTRUMENTS & SYSTEMS DIVISION
Together...we'll create tomorrow.

BAUSCH & LOMB

TM Trademark of Houston Instrument.
* U.S. Suggested retail prices.
Centronics® registered trademark of Centronics Data Computer Corp.

Panelists 'Debate' Censorship of Cryptology

By Brad Schultz
CW New York Bureau

HOUSTON — The president and president-elect of the Association for Computing Machinery (ACM) barely disagreed in a National Computer Conference "debate" on censorship of cryptology — the study of encryption and code breaking.

They described how the idea of censoring publication of cryptological research has troubled a number of computing professional societies and at least one major figure in the U.S. intelligence community — Admiral Bobby Inman, the former director of the National Security Agency (NSA) who is retiring as deputy director of the Central Intelligence Agency and a naval officer.

At the NCC session he chaired last week, SRI International Inc. Vice-President David H. Brandin said national security was so threatened by unchecked publication of research in cryptology — research commonly undertaken by computer scientists — that he supports certain guidelines for making security clearance of cryptology papers a precondition of publication.

Those guidelines came from a panel, comprised of academicians and NSA's general counsel, known as the Public Cryptography Study Group. The lone dissenter from its findings was University of Wisconsin's Prof. George Davida, who has argued that so-called voluntary censorship constitutes unjustified suppression of liberty.

Amendments Violated?

Brandin indicated that courts might interpret compulsory censorship of scientific research as violating the First, Fourth and Fifth Amendments to the U.S. Constitution. The First Amendment protects freedom of speech; the Fourth bans "unreasonable" seizure of private papers; and the Fifth, in part, sets the conditions under which persons may not be deprived of property.

Purdue University's Prof. Peter J. Denning, whom Brandin will soon succeed as president of ACM, conceded that such voluntary prereview may be warranted, but described "a mosaic of distrust" researchers have of the intelligence community, which would do the prereviewing.

Brandin quoted Inman as calling the Battle of Midway, during World War II, a prime example of how cryptology has affected the fortunes of nations.

By cracking the Japanese secret code, U.S. military intelligence learned the course and heading of a fleet of Japanese warships. That fleet was intercepted and destroyed, ending Japan's thrust toward the Western U.S., Brandin noted.

Under the International Traffic in Arms Regulations (Itar), "cryptosystems" or information on how to build them may not be exported without authorization by the State Department, Brandin told the session. Nevertheless, the Defense Department's NSA — as the federal authority on cryptology and communications security — worries that computer scientists in academia and industry may compromise national security by discussing cryptological research at symposia and by publishing research results in journals and reports.

Despite Itar, Brandin observed, agents of nations unfriendly to the U.S. could infiltrate cryptology sym-

CW At NCC

posia or simply subscribe to or purchase pertinent journals and reports to learn the latest techniques for building systems that encrypt computer-stored information. Such systems supposedly render transmitted data unintelligible to any but intended receivers.

Especially while he skippered NSA, Inman tried to interest the computer science community in voluntarily working with NSA to limit the spread of cryptology results that could endanger the U.S., Denning asserted.

In formal pronouncements on cryptology-related issues, NSA has identified two chief dangers:

- The "hemorrhaging" (as Inman once termed it) of such technology into enemy hands could allow enemies to implement computer systems with security the U.S. could not breach.
- The hemorrhaging could allow enemies to learn how to breach the security of strategically important computer systems implemented in the U.S.

DEC
VT-131 new $1250
LA-36 used $350
LS-120 used $795
LSI BOARDS-PDP MODULES NEW PRICED TO SELL
TI 745 used $595
TBC Terminal Brokers Co.
2001 West Main St.
Suite 304, Std., CT 06902
203-964-9331

The confidence that comes with choosing TRW service.

It's a solid business decision.

We'll keep your equipment up and running. Service is our business, our only business.

We'll give you more service for the service dollar. TRW provides service for many large computer manufacturers – including most plug compatible peripheral equipment. One service contract. One service call. Single source service.

You'll be assured that your computer hardware is of top quality. TRW services only the best equipment. We carefully evaluate each product to ensure that its design and performance meet highest industry standards.

You'll be protected because TRW Customer Service Division is the largest independent maintenance organization in the nation. Almost 3000 carefully trained professionals in over 200 U.S. locations allow us to respond when you need us.

TRW services only quality products.

Quality all around. It's the only way we do business.

TRW
Customer Service Division
TRW Communications Group

Oh, the joys of being a dp professional.

It's always been easy to tell when a job runs wrong. But it's never been an easy task to find out how to put it right.

You can waste countless hours trying to find the answer; searching through out-dated run books and other documentation.

And all the while you're looking, the clock is ticking.

The schedule goes out the window. Your operating costs go up again. Unhappy users get fed up with waiting and start calling. And your staff gets frustrated putting out fires.

All because there's never been a cost-effective program to help you manage production failures.

Until now.

The solution's in sight

Triangle Software's new ProDict™ program will help you manage all the complexities of Production System Management faster, easier, better than you ever thought possible.

It's made possible because our ProDict program is an active, automatic, on-line dictionary of all your production jobs, data sets and programs.

Input to ProDict software is automatic, from JCL at production turnover time. And the output is accurate production documentation—on-line or hard copy—better scheduling, reliable contingency planning, and faster disaster recovery.

Cut costs in half in just half-an-hour

The ProDict software package is easy to use. With no more than 30 minutes effort, you can have it working for you, because it requires no changes to the standard JCL you're working with now.

Our ProDict program can save you countless manhours, even mandays, now wasted manually searching listings to validate a change to a job or a data set. It can halve your costs of production system maintenance. And it will give you concise, up-to-the-instant, accurate information to make decisions your company can depend on.

Improve productivity with ProDict software now

For all the information about all that our ProDict program can do for you, call or write us, right now.

We truly understand your problems, and we are intent on helping you solve them.

We welcome the opportunity to get you doing exactly what our other customers are doing: Jumping for joy.

See us at Software Info booth 245

Triangle Software Company

2651 Kentworth Way, Santa Clara, CA 95051 (408) 727-4391

©1981 Triangle Software Company
ProDict is a trademark of Triangle Software Company

In Industrial, Manufacturing Firms

CMU Goal: Applying AI to Management Tasks

By Marguerite Zientara
CW Staff

HOUSTON — In light of the current explosion of interest in artificial intelligence (AI), one may wonder what is reasonable and what is unreasonable to expect from the discipline now and in future years.

In "Machine Intelligence: From the Laboratory to the Cold World," a technical session held last week at the National Computer Conference, Mark Fox described Carnegie-Mellon University's (CMU) Robotics Laboratory's goal as "extending and applying AI techniques to managerial and professional tasks in industrial and manufacturing organizations." Such tasks include job shop scheduling, project management, long-range planning, systems diagnosis and man-machine interfaces.

Fox explained CMU's work for the Westinghouse Turbine Component Plant, which produces turbine blades in a process that encompasses thousands of part numbers and 20 operations. Since human schedulers spend 10% to 20% of their time scheduling and 80% to 90% of their time determining constraints, Fox and his colleagues developed Isis-II, a constraint-directed scheduling system based on AI. Constraints include due dates, available resources, shop stability, organizational goals, work in process, cost, production levels and labor size.

University as Partner

To be successful, however, a company that uses a group like CMU should see the university as a partner, not a vendor; invest in people and facilities; learn the technology; and invest in long-term research, Fox said.

AI can be a valuable tool in the area of education, according to Robert Smith, director of software for Computer Curriculum Corp. in Palo Alto, Calif. Citing the prediction that by 1990 AI could result in one million lost jobs because of factory automation, Smith claimed that computer-aided instruction (CAI) using AI can teach a worker to use and maintain equipment.

"The problems in CAI lie in economic factors," Smith said. It takes 100 hours of preparation using "standard CAI" to produce one hour of lesson material, he said. In "intelligent CAI" using AI, 1,000 to 10,000 hours are needed for one hour of educational material.

AI Contributions

In spite of this "impediment to broad use," Smith said, AI's contributions to CAI include ideas, tools and techniques, according to Smith. Ideas include learning and cognition, information processing psychology and computing methodology; tools include languages, utility programs and tool-building methodologies; techniques include in-house methods of developing systems to speed up CAI system development.

Besides the economic considerations, scientists must be concerned with "reliability of AI systems and with using clarity in expressing what a system does, in fact, do," Smith said.

Larry Harris of Artificial Intelligence Corp. in Waltham, Mass., discussed the growth and maturity of natural language data base query systems. "There is a happy and rapidly growing user base out there," Harris said, "and the reason for the growth is that the systems solve the problem better than other choices."

Noting that it takes two to three years to develop a successful natural language query system, Harris warned against the "premature release syndrome," in which the developer "spends lots of time making excuses about why the system didn't work, and the user doesn't really care about excuses."

Session leader Alex Borgida of Rutgers University described his work in developing large information systems, as in hospitals. "Our philosophy is to start with the human and try to emulate the way he does things," Borgida said.

CW At NCC

The design of a large system is "tedious and error-prone, but does not contain complex algorithms," Borgida noted. In such development, the "correctness of stored data is essential and the system must incorporate a real-world knowledge of the company or business involved," he added.

Rutgers has developed the Taxis language for information system development, which offers advantages over the traditional approaches such as IMS and Cobol, Borgida claimed.

Likely future developments in the science include software that can manage irregularities, can deal with incomplete or partial information, features a built-in notion of time and can access and modify meta information, Borgida predicted.

Telex creates a display of a different color.

No programming or system changes.

Just plug into Telex 174/276 or 3274/3276 controllers. The new Telex 279 Color Keyboard Display Station is much more than just another pretty display. It's significantly different from other color displays in several key ways.

For one thing, the Telex 279 is completely transparent to the controller. This means you can have the benefits of color without having to make complex, time-consuming programming changes or costly system upgrades. Just plug the Telex 279 into your Telex 174/276 controller or IBM 3274/3276 controller and you'll have all the advantages of displaying alphanumeric color data instantly at your fingertips.

The advantages of color are easy to see. Color helps increase operator productivity through faster recognition and understanding of color displayed fields. And much more.

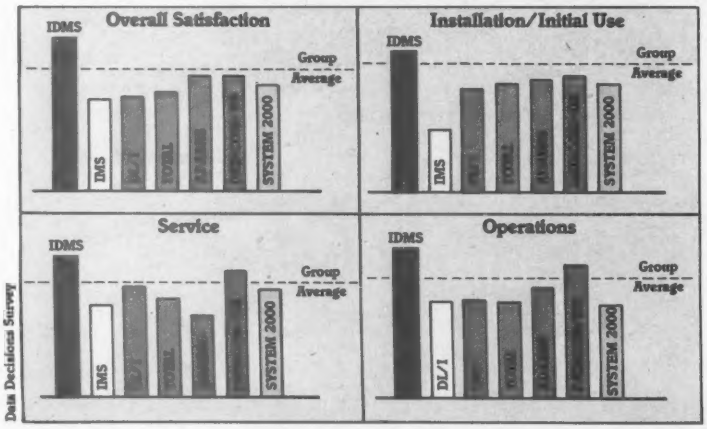
For more information on Telex color displays and our full line of terminal and peripheral products, contact John Hawkins toll free at 1-800-331-2623.

Telex Computer Products, Inc.
Terminals/Peripherals/Systems/OEM Products
6422 East 41st • Tulsa, Oklahoma • 74135
Phone: (918) 627-1111

The innovation continues... **TELEX.**

Enough said.

Data Decisions' 1981 survey shows Cullinane's Integrated Database Management System (IDMS) to be the number one choice among DBMS users. Once again, IDMS has achieved higher ratings than any competitive product in the categories of reliability, ease of installation and use, quality of technical support and overall satisfaction. Additionally, a recent Datapro Research survey shows IDMS to be #1 in more categories than any competing database management system.



What does this mean? It means that IDMS continues to live up to our promises of high performance and ease of use. That the quality of our documentation and training remains unsurpassed. And that our customer service is faster and more thorough than any other supplier's. Who says so? The most impeccable source available — the industry's DBMS users.

FREE SEMINARS

Find out more about the database management system that's consistently at the top of the charts. Attend a free seminar in your area. To register, just fill out and mail the coupon.

Dates and Cities

Atlanta, GA June 15
Atlantic City, NJ June 22
Boston, MA July 15
Bridgeport, CT June 29
Chicago, IL June 22
Cleveland, OH June 23
Dallas, TX June 24
Des Moines, IA June 22
Halifax, NS June 16
Hamilton, ONT June 17
Hartford, CT June 17
Houston, TX June 16
Jacksonville, FL June 17
Kansas City, MO June 30
Los Angeles, CA June 15
Memphis, TN June 29
Miami, FL June 24
Minneapolis, MN June 24
Montpelier, VT July 20
New York, NY July 29
Oklahoma City, OK June 29
Ottawa, ONT June 23
Piscataway, NJ June 16
Pittsburgh, PA June 15
Providence, RI June 22
Raleigh, NC June 22
South Bend, IN June 15
Toronto, ONT June 29
Troy, MI June 30
Washington, DC June 17
White Plains, NY July 14

I plan to attend a seminar in _____ (City) on _____ (Date)

☐ Please send me information on IDMS.

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone ( ) _____

My computer is _____

Mail to: Rosalie Cope, Cullinane Database Systems, Inc.
400 Blue Hill Drive, Westwood, MA 02090
Phone (617) 329-7700

Database Systems

Database: Cullinane

CW/6-14

Small Systems Users Rank Reliability on Top: Report

By Lois Paul
CW Staff

FRAMINGHAM, Mass. — Reliability is a more important consideration than price when users of small computer systems choose software packages, according to the results of a report entitled "The Whys and Hows of Packaged Software Buying" from International Data Corp. (IDC) here.

Based on a survey that garnered responses from 217 recipients (4.9%) to a mailing of 4,464 questionnaires, the report ranked the criteria users feel are most important when it comes to final selection of software (see chart). Ranked highest in order of importance were performance quality/reliability, compatibility with present hardware and software, price, supplier/product reputation, ease of use and documentation support.

The overwhelming answer (from 58.5% of respondents) to the question, "Why are users buying packaged software?" was new applications.

The primary uses of the software packages installed on small systems included word/text processing, accounting, applications development, financial planning/analysis and data management, the surveyers reported.

According to IDC, users are obtaining their software from the following sources:

• *CPU manufacturers.* They are the overwhelmingly preferred source for operating system software.

• *Independent software suppliers.* This is the most popular source for utility packages, although hardware manufacturers and in-house programming were not far behind.

• *Independent software suppliers.* While these suppliers were the first choice for applications software, in-house programming did make a strong showing. In addition, a significant enough portion of applications software was obtained by respondents from CPU manufacturers to support the recent trend among hardware vendors of offering more of this type of software.

Hardware manufacturers that users mentioned most often as the source of their software were Apple Computer, Inc., Digital Equipment Corp., IBM, Hewlett-Packard Co., Sperry Univac and Radio Shack.

The majority (54%) of systems to which users referred when discussing software selection were desktop models (microcomputers), the IDC surveyers noted.

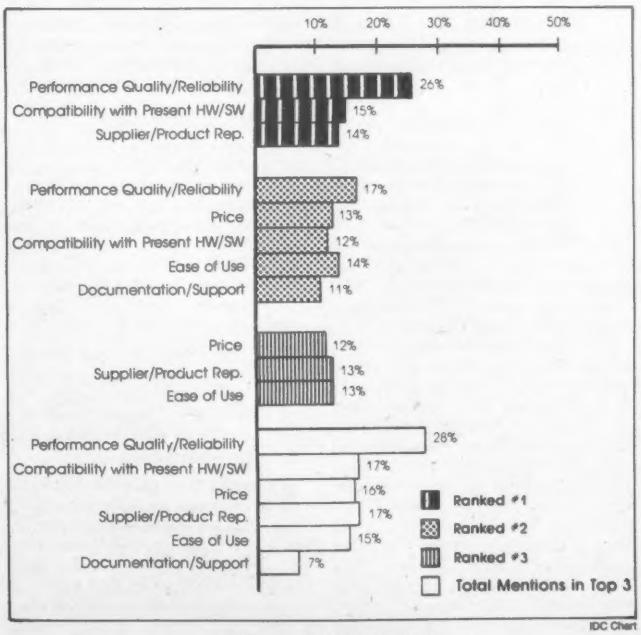
Survey Respondents

Respondents to the survey represented companies with revenues largely less than $10 million. They included management information systems managers who control all company computing resources, departmental managers overseeing their own minicomputers and first-time, upper-management-type users learning to program their own applications with personal computers running word processing and basic accounting.

The users reported that a consideration of the company's needs and the vendor's resources during the decision-making period can help maximize a proper package "fit" for their organization.

They also recognized the importance of considering the organization's corporate goals, its technical and end-user requirements and cost/benefit ratios while examining issues such as product quality; the functional capability and long-term viability of the software; and the availability of support, maintenance, documentation and training from the vendor.

The 113-page report, "The Whys and Hows of Packaged Software Buying," is available from IDC's Software and Services Program for $2,500. IDC is at 5 Speen St., Framingham, Mass. 01701.



Software Criteria by Rank

Introducing
THE
ERGONOMICS
NEWSLETTER,

a bi-monthly publication exclusively dedicated to the in-depth coverage of office ergonomics (human engineering). Each of the six yearly issues will bring product evaluations, news, analysis, interviews and other articles relevant to the ergonomics aspects of office systems, software, equipment and environment. Readers should be individuals with a vested interest in keeping abreast of this increasingly important area of office automation, such as system designers, consultants, office managers, marketing specialists and manufacturers.

Our editorial and research staff mainly consists of graduated engineers with extensive experience in industry and research. Also contributing to the newsletter will be renowned experts from industry, research and government who have a distinctive understanding of ergonomics.

For more information about how to subscribe to The Ergonomics Newsletter, call (213) 459-4429. Or clip this ad and send it with your business card to The Koffler Group, 1301 Lachman Lane, Pacific Palisades, CA 90272.

SPEED READING COURSE FOR HP-3000.

Dylon's Series Five can cut recording time in half on any HP-3000 computer system.

- Fully software compatible, uses existing HP software
- Dual density, 800/1600 cpi to 125 ips
- Disk back-up and start/stop flexibility

For details and specifications on how a Dylon system can help any HP-3000 series computer read and write faster, call us collect.

(714) 292-5584 Available Now

Dylon 9561 Ridgehaven Court, San Diego, CA 92123

Please send me more information on the Dylon Series Five.

Name_____
Company_____
Address_____
City_____
State_____ Zip_____ Phone_____

Study to Probe Ethics in Applying DP Models

By Marguerite Zientara
CW Staff

PRINCETON, N.J. — With the increasing use of computer modeling as a basis for government policy decisions, a management scientist and a philosopher are undertaking the first systematic examination of the ethics of such practices.

Working under a two-year National Science Foundation (NSF) grant, John M. Mulvey, a professor at Princeton University's School of Engineering and Applied Science, and Chris McMahon, assistant professor of philosophy at Princeton, will attempt to identify, analyze and categorize ethical problems faced in those situations.

Computer models "incorporate dubitable and value-laden assumptions and their applications raise ethical questions," according to the pair's NSF Project Summary. "For instance, incorporating into a model one demographic projection rather than another of apparently equal validity can make the selection of one waste-disposal site appear superior.

"Furthermore," the summary continues, "scientists and engineers who design and apply these models may not know about or [might] be constrained for various reasons from discussing the limitations of their assumptions."

Survey Scenarios

Now in the preliminary stages of the project, the researchers are developing a set of "five to seven" scenarios that will be used to survey the responses of model developers and users to ethical problems, Mulvey explained.

One possible scenario might involve deciding where to build a chemical waste-disposal plant, Mulvey indicated. "It might be that there are certain risks involved, and the question might be, 'Do you inform the neighboring population of the risk in your analysis?' They might not be so receptive to the plant if there were risks," he noted.

Another example might concern the building of a large dam, Mulvey said. "Say [an engineer] was required to use a cost/benefit analysis for deciding whether the dam was beneficial or should be built. And yet he felt the cost/benefit analysis minimized the noneconomic consequences of the project and, in fact, didn't take into account the risks involved," Mulvey said.

"Since the government required the cost/benefit analysis technique to be used, [the engineer] stuck with the method, but on weekends went off and did a risk analysis," Mulvey postulated.

"Say the engineer came to the conclusion the dam shouldn't be built because the risks were fairly large, but the cost/benefit analysis showed that the dam's costs didn't exceed the benefits," he said.

The engineer could then either "show people his risk analysis and hope they would see it was more comprehensive than the cost/benefit analysis," Mulvey suggested, "or he could perhaps manipulate the cost/benefit analysis to show that, taking into account the risks, the costs are higher." These actions could be taken surreptitiously or openly, he added.

"The conflict is between one's role as a private citizen and one's role as an analyst serving a client," he added. "Perhaps the client is the Corps of Engineers, and they have a vested interest in building the dam, for example."

Testing Phase

When the scenarios are completed, they will be tested "with a variety of people, both inside and outside the profession, to see if there's any divergence of opinion regarding what is ethical conduct and what might be considered unethical," Mulvey said.

In addition, the investigators will conduct several panel discussions "with people who have been involved in modeling work," Mulvey explained.

Ultimately, the pair will consider "whether and how current codes of professional conduct can be improved so as to provide adequate guidance and recourse to computer modelers, their clients and the public," according to the Project Summary.

After examining existing codes of ethics from various computing and statistical societies, Mulvey noted, "Our initial impression is that they are fairly vague in some ways and perhaps don't pinpoint what might be considered an ethical choice as made by a model."

Battle Over Ecom Continues

WASHINGTON, D.C. — Although opponents of Electronic Computer-Originated Mail (Ecom) lost a significant battle last April, they have not given up the fight.

The Department of Justice, which went to the U.S. Circuit Court of Appeals in Washington, D.C., in an effort to halt the service, told the Postal Rate Commission (PRC) recently that "the United States, as well as other parties in this proceeding, has not exhausted the potential remedies available to stop what is in our view the illegal action of the United States Postal Service in offering Ecom."

The Justice Department's comment was filed shortly after the PRC tentatively decided to change Ecom from an experimental to a permanent service. Besides the Justice Department, the National Telecommunications and Information Administration (NTIA), along with three vendors — GTE Telenet Communications Corp., Satellite Business Systems and Graphnet, Inc. — opposed making Ecom a permanent offering. The PRC's final decision is expected later this month.

"Virtually all parties to this proceeding agree that ... virtually no credible information regarding likely public demand for this service, if priced on a full cost-recovery basis, has been provided," NTIA said.

Cost Divergence

The Justice Department added that the present Ecom base rate — 26 cents for the first page transmitted — assumed capital costs of $7.4 million. However, the system chosen by the Postal Service has an estimated cost of $38.6 million, "strongly suggesting that the proposed rates cannot be compensatory," the Justice Department statement to the PRC added.

It may be significant that the appeals court, in rejecting the government's appeal last April, suggested that opponents of Ecom would still be free to object to continued operation of the service.

Meanwhile, Rep. Glenn English (D-Okla.), chairman of the House Government Information Subcommittee, has asked Postmaster General William Bolger to explain why a new rate has not been filed for Ecom. "I remain confused and concerned over whether the current rate is compensatory," English said.

FREE
ACCOUNTING SOFTWARE

with purchase of

HP3000 COMPUTER SYSTEM*

Package includes complete A/R, A/P & G/L
(We also supply a wide range of other business applications)

For further information, contact Hans Frontschek or Ed Lorman at (212) 964-9600.

SOFTWARE SYSTEMS TECHNOLOGY, INC.
15 Park Row, 25th Floor, New York, NY 10038

*Offer expires July 31, 1982.
Valid only for minimum hardware purchase of $100,000.

LOOKING INTO ELECTRONIC MAIL?

Save Research Time — Find Out Who Is Selling What

THE SURVEY OF ELECTRONIC MAIL SYSTEMS

A 180 page, comprehensive, functional review and analysis of 21 computer-based message systems including subscription services, software packages and turnkey systems for mainframes, mini- and micro-computers and word processors.

COMET • DIALCOM • IBM • WANG • INFOPLEX
XEROX • MESSENGER • TELEMAIL • INFOMAIL
and 12 more

There is no other resource like this anywhere! This in-depth functional analysis is prepared by the office automation consulting firm with the most experience planning and implementing electronic mail, executive information inquiry and voice messaging systems today.

The Survey costs $975. Call Susen Kay at (312) 843-3123, or write:

Hannagan & Associates, Inc.
909 PLAZA DRIVE, SUITE 400
SCHAUMBURG, ILLINOIS 60195
320 EAST 46th STREET
NEW YORK, NEW YORK 10017

EEC SYSTEMS

LEX-11
WORD AND DATA PROCESSING
FOR VAX, PDP-11 AND LSI-11

- Integrated word, data list processing
- Supports RT-11, TSX-PLUS, RSX-11M, RSTS/E, UNIX, IDRIS, IAS, VMS
- Fast, friendly, flexible
- Calculator, Graphics
- Spelling Dictionary, Forms
- Custom modification easy
- ASCII Formated Files
- Report Writer,Data Entry
- OEM Discounts

EEC Systems Dept. COW
286 Boston Post Road, Wayland, MA 01778
(617) 358-7781/2 (617) 443-6376

Model Said Based on Faulty Premise

Nuclear Disposal Study Breeds Controversy

By Susan Blakeney
CW Staff

JACKSON, Miss. — Controversy is brewing over a computer-based modeling study which revealed that there would be no detrimental economic side-effects if a nuclear waste disposal facility were erected here.

The research was conducted by personnel at Jackson State University, which, along with the Mississippi Research and Development Center, has voiced doubts about the study's conclusions. Representatives from both organizations claim that the computer models were reflective of relatively unpopulated Western states, rather than the more populous Mississippi regions of Perry and Marion counties.

Cost $76,000

The Social and Economic Assessment Model (Seam), which cost $76,000 to develop, was made possible by a grant from the U.S. Department of Energy. Seam concentrated on the economic and social impacts of the planned project and excluded the study of possible adverse effects due to fear of the nuclear waste repository's physical presence.

The model was reportedly designed to project economic consequences when large numbers of construction workers moved into small mining towns in the Western U.S. states.

Overall, the study concluded that "assuming no populated land area must be vacated or limited in use because of the repository's existence, there will be only limited negative economic impacts, if any, from construction and operation of the repository."

Furthermore, the report maintained that the state would probably benefit from the facility's development, in terms of tax revenues, new jobs and increased personal income after it is completed. "In the 10th year of the facility's life, for Mississippi as a whole, impacts include about 2500 new jobs, $170 million added personal income and $12 million in additional state tax collection."

Totally Unrealistic'

Kenneth Goodwin, a community development engineer with the MRDC in charge of reviewing the report, said the economic projection was "totally unrealistic and places in question the credibility of the entire study since the public service impacts were supposed to be the major elements of the Seam model."

He maintained that many of the jobs created by the nuclear disposal cite could not be filled by people in neighboring towns, and that the study failed to take that into consideration.

"They picked a model that was not applicable — based on our experience, we know a lot of things that just wouldn't happen that way," he said.

John Wade, assistant professor of management at Jackson State, and one of the chief authors of the study, agreed with many of Goodwin's points, but reportedly maintained that the study was actually conducted to test Seam's ability to predict socioeconomic effects on the area surrounding a nuclear waste facility.

In an earlier report, Wade referred to the report as "a very limited model exercise."

PURE DEC
11/44-CA
256 kb MOS
(unused)
H960 cabinet
RJM02
$39,500

11/70
256kb core
H960 cabinet
RWP06
$58,000

Carl R. Boehme & Assoc.
Specialists in Digital Engineering
Phone (408) 727-2666
Telex 172337

Newsletter Out on System/38

SILVER SPRING, Md. — A monthly newsletter for IBM System/38 users called "38/Special" has been published here by the Computer Services Division of Professionals Unlimited.

The newsletter will reportedly provide information on System/38 software and products as well as services.

It will also feature sections listing tips and techniques, a contact service, a calendar of events, an index to other publications and a question and answer column.

The annual subscription rate for this publication is $49. The company also announced its *1982 1/2 Software-Service-Vendor Directory* also for IBM System/38 users.

This directory covers over 100 applications and 350 vendors, according to the publishers. It is available on diskette.

The directory costs $29.95 and can be ordered from Professionals Unlimited, 3951 Lantern Drive, Silver Spring, Md. 20902.

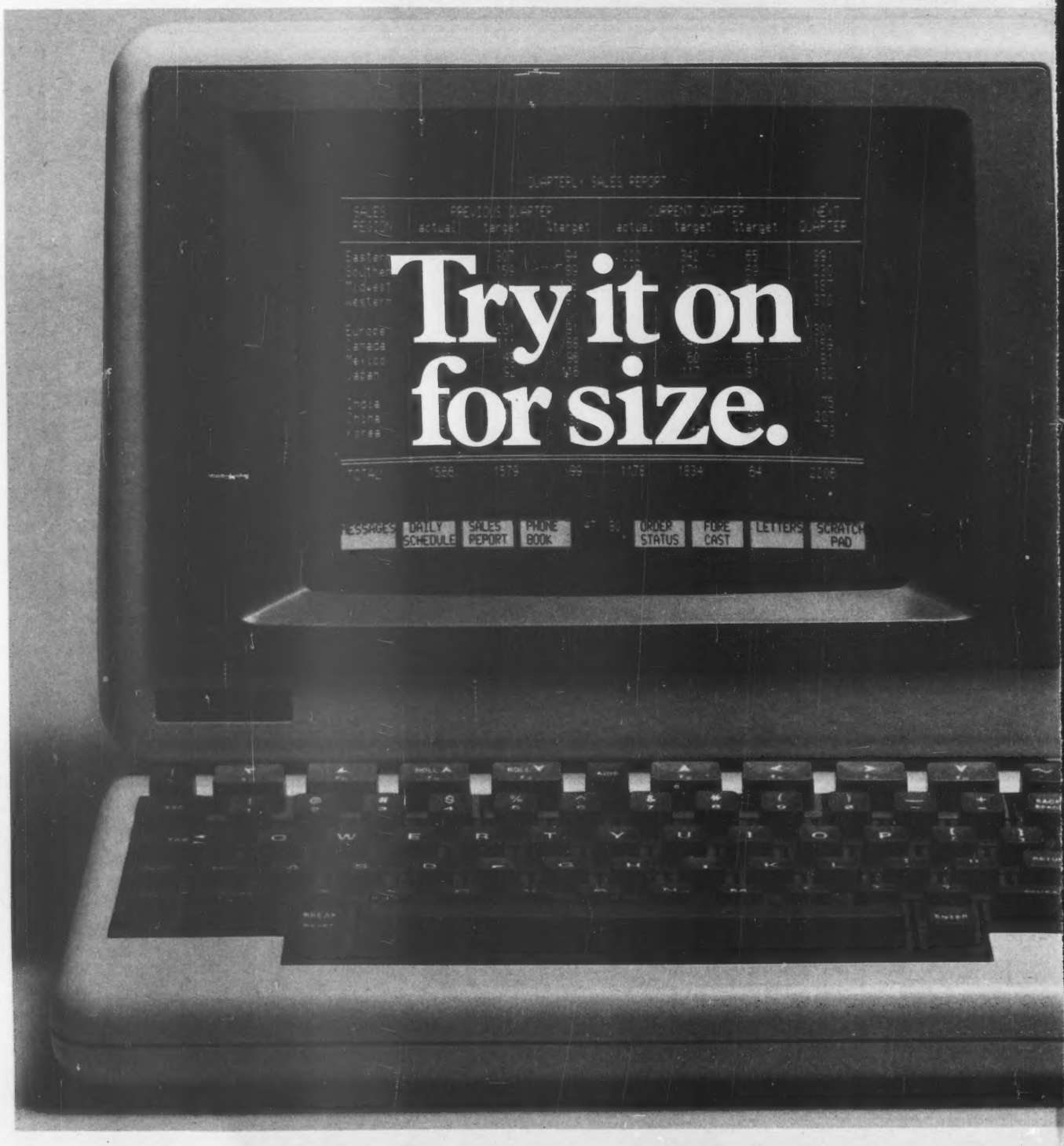
ASI Instructional Series Offered For Cullinane Software Users

ARLINGTON HEIGHTS, Ill. — Advanced Systems, Inc. is offering its IDMS-1982 Education Series for users of Cullinane Database Systems, Inc. software. ASI reached an exclusive agreement with Eastern Technical Associates, Inc. to obtain the materials.

The five-course, 61-tape series spans more than 120 hours of in-depth skills-building instruction, ASI claimed. For example, IDMS-DB covers all aspects of concepts and facilities, programming considerations and data base design.

IDD is a comprehensive course covering Cullinane's recent Release 3.0 with special emphasis on all basic entities, user-defined entities and cross-referencing capabilities.

The price for the series may run as low as $50 per tape, depending on the size of the customer's lease contract, ASI said from 2340 S. Arlington Heights Road, Arlington Heights, Ill. 60005.



Services Branches in All States

Discount Brokerage Firm Takes Stock in DBMS

SAN FRANCISCO — When the Securities and Exchange Commission (SEC) ruled that brokerage firms could unfix their rates seven years ago, Charles Schwab and Co., Inc. found itself at a crossroads.

The company had been established four years earlier as a full-service brokerage firm, but the SEC decision pushed the company's direction to discounting, and business skyrocketed.

The firm — with a 65% annual growth rate — now transacts more than $2 billion worth of securities business annually for its more than 200,000 customers nationwide.

In order to capitalize on the discounting boom, Schwab decided to install an on-line data base management system to service all branches, located in every state. Schwab intended to provide full service to customers at each branch within seconds.

After analyzing system requirements, the firm soon found a system to fit its needs — the Beta System from Blunt, Ellis and Loewi, a Milwaukee-based brokerage firm. The Beta System uses Datacom/DB, a relational data base management system, and Datacom/DC, a teleprocessing monitor, from Applied Data Research, Inc. (ADR).

A three-person staff made the system operational in four months. "We needed a highly reliable and very fast system that required little maintenance," recalled G. K. Chalmers, vice-president, technical support.

"It also had to be easy to tune. When you've been growing at 65% a year, it can be a DP manager's nightmare, especially with such a small staff," he added. "We needed a system that would take very little time to learn and would respond to this incredible growth rate."

In the last three years, the system has grown to support more than 500 terminals in 36 branches. With a reportedly excellent response time, Schwab processes an average 125,000 transactions daily.

In a pioneering effort using Datacom/DC, Schwab developed a computer-to-computer link with the exchange computers. Schwab can submit an order and report or confirm a trade in as little as 12 seconds, while the customer is still on the phone.

"When a client calls and gives us his account number and we can tell him all of his trading activity for the last two months, including up-to-the-moment executions within seconds, it's a tremendous competitive advantage," noted William Pearson, executive vice-president. "We're able to handle more clients' activity with fewer people and provide a lot better customer service."

Schwab is continuing to add other ADR products and upgrade its hardware. The company now has Datacom's data dictionary, on-line query language, on-line masking and report writer facilities and The Librarian for source code management.

Hardware includes an IBM 3031, 4341-II, nine 3350-A2 drives and a Comten, Inc. 3650 front-end processor.

Prop up this magazine against your IN Box and you'll get a good idea of how the new HP 2382 office display terminal would look on your desk. It's that small!

It's got a price to match.

At only $1700, the HP 2382 provides an affordable and personal "information window" for people in many different departments. They'll be able to see at a glance the information they need for responsible decision making. Whenever they need it.

It's very fitting.

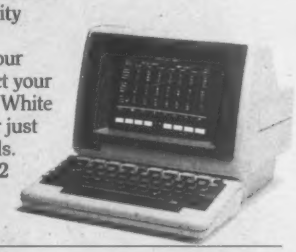
The 2382 is really a full-capability terminal—with "big terminal" features like screen-labeled soft keys, block mode and local editing. But its compact and pleasing design makes it as easy to accommodate on the office desk as the telephone. And it's almost as easy to use.

The detached typewriter-style keyboard has a coiled cord that won't interfere with the desktop work area. And the keys have a sculptured profile and a velvet finish for a friendlier feel. There's even a deep-dish touch on the "F" and "J" keys for easy location of the "home row."

The HP 2382 works with computers from most major manufacturers. But no matter what system you use it with, it's backed by HP's worldwide service organization. *And* our reputation for high-quality products.

Prop up this magazine on your manager's desk, too. Then contact your local HP sales office listed in the White Pages to size up the situation. Or just return the coupon for more details.

You can size up the HP 2382 at Productivity '82. Watch your newspaper for more details.



HEWLETT PACKARD

Yes! I'd like to find out more about HP's new office display terminal.
☐ Send information on HP's complete line of data terminal products.

Name
Title Phone
Company
Address
City
State Zip

Mail to: Hewlett-Packard, Attn: Tom Anderson, Dept. 03116, 974 East Arques Ave., Sunnyvale, CA 94086.

CW 6/14

Price U.S.A. list—subject to change without notice. 42104 HPT 80
Keyboard reproduced actual size (11" wide); CRT appears slightly smaller because of photographic perspective.

Metrotech Project Set In N.Y., Boasts R&D Center

By Bob Johnson
CW New York Bureau

NEW YORK — Plans for a $171 million high-technology complex centering around telecommunications were announced here recently by the New York City Public Development Corp. (PDC) and the Polytechnic Institute of New York.

Dubbed the Metropolitan Technology Center, or "Metrotech," the proposed 16-acre downtown Brooklyn project would include a research and development center and offer telecommunications facilities to Polytechnic and area industries, according to the PDC.

In addition, the complex is slated to have a technology library with on-line access to other information sources and a telecommunications research center. It will require the purchase of substantial hardware and the hiring of technological staff, but officials said no vendors have yet been chosen to supply the center.

Construction is scheduled to begin in the early part of 1983 on the center, which was conceived as a result of a study performed by the city's Office of Economic Development.

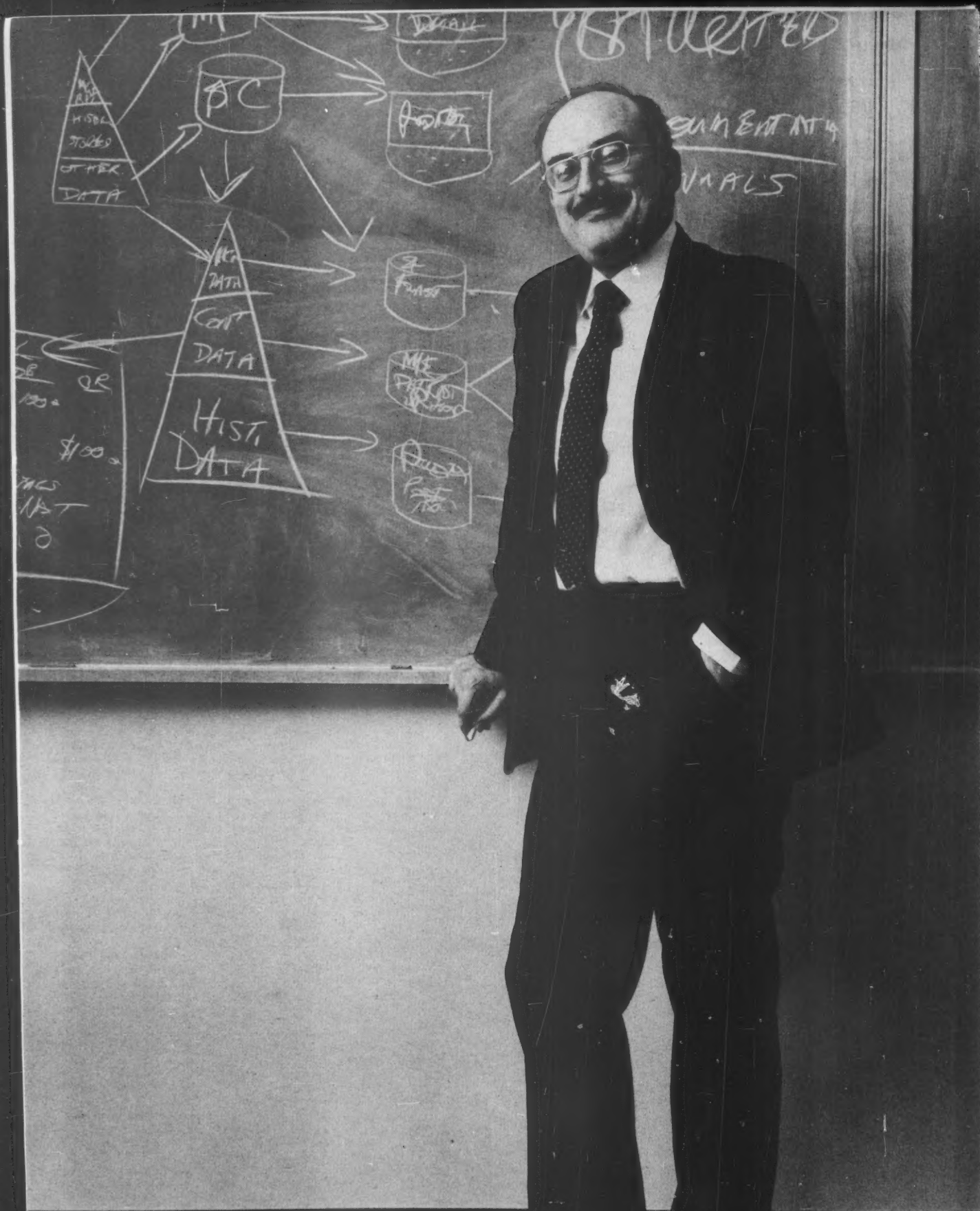
Dr. George Bugliarello, president of the Polytechnic Institute, said he hopes the joint effort between the institute and New York City will be what MIT is to Cambridge's Technology Square and Route 128 in Massachusetts and what Stanford University is to Silicon Valley.

The major tasks of the center will focus on telecommunications, according to Bugliarello, who said the New York City area is a prime choice for the new complex for three reasons:

- Its close proximity to what he referred to as the immense office automation market.
- It is bracketed by major producers of computer and information technology such as IBM and Bell Laboratories.
- Polytechnic's strength as an educational body in the area of microwave and communications research.

"Our research is these areas is probably the strongest in the country," he said.

A Technology Information Center (TIC) is planned as part of Metrotech. The $12.5 million TIC, which will be used as a technical resource for small and medium-size businesses, "will be an in-city integrated telecommunications facility that will provide information linked electronically to other data sources, both nationally and internationally," Bugliarello explained. It will be hooked-up via satellite and have a staff of telecommunications experts.


PC
HISTORY STORED
OTHER DATA
CONT DATA
HIST. DATA
$100

The man who taught financial software to Princeton University, Blue Cross, DEC, Max Factor, Philip Morris, Campbell Soup, Colgate-Palmolive, Volkswagen, Pizza Hut, Johnson & Johnson, Rolls Royce, Kodak, Heinz, Hertz, Pepsi, CBS, Newsweek and the United Nations.

He's Alan Rick, a McCormack & Dodge training instructor. A member of a teaching team which has won the reputation, hands-down, for the best hands-on training in the financial software industry.

Clients find our training schools as valuable as our software packages. Enrollment has grown from less than 300 in 1977 to over 3,000 in 1981. People have come from more than 150 Fortune 500 companies. From departments with such demanding workloads that any system but the fastest and most powerful is simply out of the question. Whether it's for accounts payable, capital projects analysis, fixed assets, general ledger, personnel/payroll or purchase order management.

At McCormack & Dodge, we work hard to make our schools—and our entire company—as user-oriented as the software we design. The usual result is that people who sit down and talk to us do more than just talk. They become customers. We'd like to show you why.

McCormack & Dodge

(800) 343-0325*

*In Mass. (800) 322-1098

The best financial software. The best financial people.

McCormack & Dodge, Inc., 560 Hillside Avenue, Needham Heights, MA 02194. North American offices in Atlanta, Chicago, Dallas, Los Angeles, New York, San Francisco, Washington D.C., Montreal, Toronto and Vancouver. International support in Argentina, Australia, Belgium, Brazil, Colombia, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Malaysia, Mexico, New Zealand, Netherlands, Norway, Peru, Portugal, Singapore, South Africa, Spain, Switzerland, Sweden, United Kingdom and Venezuela.

Normal Investigation

Mail Bomb Case Still Unsolved by Post Office

By Brad Schultz
CW New York Bureau

MEMPHIS, Tenn. — The U.S. Postal Service remains stumped on why a package mailed to the chairman of Vanderbilt University's Computer Science Department blew up a month ago, injuring his secretary and damaging his office [CW, May 17].

So said Assistant Postal Inspector in Charge John Brady here in an interview last week. Mail bombings like the one in the office of Prof. Patrick C. Fischer at Vanderbilt in Nashville, Tenn., are normally investigated by the Postal Service, Brady explained, but mail bombings attributable to "obviously terroristic organizations" are automatically referred to law enforcement agencies like the Federal Bureau of Investigation.

With its return address, the package mailed to Fischer carried the name of Dr. LeRoy W. Bearnson, a computer science professor presently on sabbatical leave from Brigham Young University's Electrical Engineering Department in Provo, Utah. He added that Bearnson has never been considered a likely suspect in the case now probed by "six or seven postal investigators."

At Brigham Young, a colleague of Bearnson's said Bearnson and Fischer had not heard of each other prior to the incident.

About the size and shape of a cigar box, the package was initially sent to Fischer at Pennsylvania State University, although Fischer left the faculty of that university to join Vanderbilt about 2½ years ago. The parcel was then forwarded from Pennsylvania State to Vanderbilt. It exploded May 5 when Fischer's secretary, Janet Smith, set off a detonator as she opened the package in the course of checking the day's mail.

Although enough of the package was intact after the explosion for investigators to discern the return address with Bearnson's name, it was not immediately clear that the package reached Fischer's office via "the regular mail stream," Brady stated. Within a few days, however, investigators reportedly identified postal employees who recalled handling the package.

ASCII to SNA/SDLC.
Smart.
(3270 Smart.)

You can make dumb ASCII terminals smart! PCI's 1076 makes ASCII CRTs appear as 3278s to SNA/SDLC hosts.

That's smart. Almost as smart as the savings you'll gain — over 50% in real dollars — when you expand or upgrade and keep the versatility and efficiency of ASCII terminals working for you!

From anywhere in the world, dial-up your host. Put a PCI 1076 wherever you would put a 3274/76. No more dreaming about letter quality printing, either. Select the ASCII printer and its now a 3287. That's *really* smart.

Optional features are even smarter! Like the specially developed graphics terminal interface that lets you use ASCII graphics terminals (Tektronics, Ramtec) on your SNA/SDLC network as 3278s. Or the PCI CoaxFace™ (patent pending) — an RS-232 to coax interface that gives you plug-compatibility without laying another foot of new cable. Or PCI's exclusive PaperCRT™ that lets any ASCII hardcopy keyboard terminal (like a TI 700) become a system compatible 3278 CRT with full screen editing capability on paper — with absolutely no applications reprogramming! And, with a single command, become a 3287. That's smart, too.

Personal-ly smart. Have your Apple III, Canon, IBM PC, Radio Shack TRS 80, or Xerox 820 be the equivalent of a 3278 *and* a 3287 (printer passthrough) and use the diskettes — *today* — on your SNA/SDLC with PCI's 1076.

The smartest of all? *You* — when you call (800) 423-5904 for your free demonstration (remote or at your site).

PCI PROTOCOL COMPUTERS, INC.

6430 Variel Ave., Woodland Hills, California 91367
(800) 423-5904 • (213) 716-5500 (in California)

Also available: ASCII to 3767 SNA/SDLC • ASCII to System 34/38 SNA/SDLC • ASCII to Bisync • Bisync to SNA/SDLC

Bill Pushes Home Units

CW Washington Bureau

WASHINGTON, D.C. — A bill to promote use of home computers for business and educational purposes by offering tax credits for computer purchases has been introduced in the House of Representatives.

Put forward by Rep. Newt Gingrich (R-Ga.), the Family Opportunity Act would offer a $100 per year per family member tax credit for up to 50% of the cost of home computer with five years to write off the investment.

Gingrich noted that the bill would enable a family of four to buy a $4,000 system and take $2,000 in tax credits over a five-year period.

Of the tax credits proposed in the legislation, the congressman said "I want every American to have access to the same opportunities that computers provide for General Electric and AT&T ... That's why working Americans should have the same kinds of tax breaks that corporations get automatically."

Gingrich said that the bill was influenced by the ideas of author Alvin Toffler, who has developed the concept of "electronic cottages," which would use high-technology equipment to allow work at home.

"The American family faces new opportunities to work and learn at home in ways that will strengthen neighborhoods and allow working mothers with preschool children to earn a living while staying home," Gingrich said.

THOMAS COMPUTER ANNOUNCES THE 3RD ANNUAL

SUPER SUMMER SUPPLIES SALE

OUR 17TH YEAR

MEMOREX IV COMPUTER TAPE
OUR LOWEST PRICE IN TWO YEARS
1600-6250 BPI

	10-90	100-490
2400'/SEAL	14.99	13.99
2400'/ELII	15.99	14.99
2400'/CAN	16.49	15.79
3600'/SEAL	26.49	25.69

5 YEAR WARRANTY

BASF ENDURA COMPUTER TAPE
1600-6250BPI NEVER PRICED LOWER

	10-90	100-490
2400'/SEAL	13.49	12.69
2400'/ELII	14.49	13.69
1200'/SEAL	9.89	9.49
600'/SEAL	8.79	7.99

3 YEAR WARRANTY

3M "BLACKWATCH" COMPUTER TAPE
WE WILL NOT BE UNDERSOLD

CALL FOR QUOTE

LIFETIME WARRANTY

MEMOREX CUBIC 6250 BPI COMPUTER TAPE
(LIMITED QUANTITY)

	10-90	100-490
2400'/SEAL	17.49	16.99
2400'/ELII	18.49	17.99
600'/SEAL	9.49	8.99

10 YEAR WARRANTY

RECERTIFIED 1600-6250 BPI COMPUTER TAPE
INDUSTRY'S FINEST

2400'/SEAL	8.99
2400'/ELII	9.49
1200'/SEAL	7.99
600'/SEAL	6.99
200'/MAILER	6.99

3 YEAR WARRANTY

VERBATIM DISKETTES WITH "DATALIFE"
CRITICALLY TESTED

BEST PRICES EVER

FREE HEAD CLEANING DISK WITH PURCHASE OF 100

8" MEMOREX DISKETTES
SINGLE SIDE SINGLE DENSITY

ERROR FREE — 1 YEAR WARRANTY

FROM $2.19 EACH

8" MEMOREX DISKETTES
DUAL SIDE DUAL DENSITY

ERROR FREE — 1 YEAR WARRANTY

FROM $3.19 EACH

5¼" MINI MEMOREX DISKETTES
WITH HUB RING — 80 TRACK AVAILABLE

FROM $2.39 EACH

GENUINE IBM BRAND DISKETTES
ORDER 50-FREE FIFTIFILE

DISKETTE MAGAZINE $9.90

	DISKETTE 1	DISKETTE 2
10-20	$3.99	$5.99
30-40	3.79	5.79
50-90	3.59	5.59
100-190	3.29	5.39
200+	2.99	5.19

CALL FOR COMPATIBILITY & YOUR PERSONAL QUOTE.
ABOVE PRICING IS FOR 100 UNITS; ADD 7% FOR SMALLER QUANTITIES.
CHECK WITH ORDER, COD, VISA OR M.C. NET 10 ADD 10%, NET 30 ADD 15%.

3348(70) DATA MODULES
ALL BRANDS
SALE OR LEASE
PRICES TOO LOW TO PRINT
CALL FOR QUOTE
1 YEAR FULL WARRANTY

DISK PACKS
2316 ..... $ 99
2316 DUAL DENSITY $109
ALL BRANDS
1316 ..... $ 49

FULLY REFURBISHED
3 YEAR WARRANTY

DISK PACKS
3336-1

IBM BRAND	$199
NON IBM	$169

ALL BRANDS

3336-II

IBM BRAND	CALL
NON IBM	$299

FULLY REFURBISHED
3 YEAR WARRANTY

5 MEGABYTE CARTRIDGES
REFURBISHED—TOP & FRONT LOAD

$49

FOR ALL TYPES OF DISC DRIVES

3 YEAR WARRANTY

NON-IBM DISK PACKS AND STORAGE MODULES
REFURBISHED
ALMOST ALL ARE LIKE NEW
WIDE SELECTIONS

CDC 9877	$249
NCR 658-201	$399
DEC RPO6	$449
DEC RPO4	$199

Call For Complete Inventory

IBM KEYPUNCHES
REFURBISHED & QUALIFIED FOR IBM MAINTENANCE

	SALE	LEASE
026	$ 750	$ 35
021(A22)	$ 750	$ 35
029(A22)	$CALL	$ 45
029(B22)	$CALL	$ 50
029(C22)	$CALL	$ 75
129(3)	$CALL	$115

IBM COLLATORS
REFURBISHED & QUALIFIED FOR IBM MAINTENANCE

	SALE	LEASE
085	$ 1200	$ 60
087	$ 2250	$125
088	$ 2250	$150
188(A28)	$15000	$500

IBM REPRODUCERS
REFURBISHED & QUALIFIED FOR IBM MAINTENANCE

	SALE	LEASE
514	$1600	$70
519	$1900	$75

ALL FEATURES AVAILABLE

IBM INTERPRETERS
REFURBISHED & QUALIFIED FOR IBM MAINTENANCE

	SALE	LEASE
548	$1500	$ 60
557	$3500	$125

IMMEDIATE DELIVERY

IBM SORTERS
REFURBISHED & QUALIFIED FOR IBM MAINTENANCE

	SALE	LEASE
082	$ 750	$ 35
083	$1595	$ 65
084	$1995	$125

NEW MEMOREX DISC PACKS
5 MEG. FROM $85
80 MEG. FROM $339
200 MEG. FROM $579
300 MEG. FROM $759

ALL TYPES STOCKED
LIFETIME WARRANTY

NEW CDC DISC PACKS
5 MEG. FROM $86
80 MEG. FROM $379
200 MEG. FROM $509
300 MEG. FROM $849

ALL TYPES STOCKED
LIFETIME WARRANTY

3M SCOTCH DISKETTES
SINGLE SIDE FROM $2.39
DUAL SIDE FROM $3.99

3M QUALITY AT THOMAS' LOW PRICE

1 YEAR WARRANTY

3M SCOTCH DATA CARTRIDGES
DC 100 A $14.99
DC 300 A $19.99

PERSONAL COMPUTING CASSETTES ALSO AVAILABLE

3M WHISPER WRITER TWX, TELEX, DDD
COMPLETE COMMUNICATIONS
IMMEDIATE DELIVERY

FREE WEBCOR "ZIP" PHONE WITH ORDER

PHOENIX CARTRIDGES 16 MEGABYTE
BASF BRAND $175
CDC BRAND $189

CDC 8 MEG "LARK" ALSO AVAILABLE

RIBBONS
FRESH FROM THE MANUFACTURER

CALL FOR QUOTE

IBM BRAND AVAILABLE

WANTED
NO LONGER NEEDED DISK PACKS, DATA MODULES, AND KEYPUNCHES IN GOOD WORKING CONDITION

HIGHEST PRICES PAID

LARGE QUANTITY USERS
CALL FOR SPECIAL QUOTES ON
OVER 500 REELS TAPE
OVER 2000 DISKETTES
OVER 20 DISK PACKS

LEASE
WE ALSO LEASE ALL PACKS AND MACHINES

LIMITED QUANTITY CLOSE OUTS

AMPEX/OPUS DISKETTES	$ 1.79
NCR FORMAT 3348	$1175.00
USED W/L SEAL	$ .49
TAPE RACKS	CALL
360/20 SYSTEM	OFFERS
IBM 3284 (2)	$ 995.00

BLANK LABEL NEW COMPUTER TAPE, 2400'/SEAL $11.50

Authorized Distributor For MEMOREX, BASF, CDC, 3M & VERBATIM

800-621-3906

THOMAS COMPUTER CORP.
600 N. McClurg Ct.
Chicago, IL 60611

In Illinois Call **312-944-1401**

24 HOUR SHIPMENT

EVERY ITEM GUARANTEED

Keeps Abreast of Mounting Work Load

Employee Benefits Division Profits From DBMS

HARTFORD, Conn. — A data base management system (DBMS) helped the Employee Benefits Division (EBD) of Aetna Life and Casualty Co. here to streamline its operation and keep up with a mounting work load.

"On the manpower side, we can effectively assign programmers who normally work with less complex tasks to projects involving more complex tasks without retraining," observed Robert Lee, chief software programmer.

It was in 1977 that EBD started looking for an appropriate DBMS. Utilizing the equivalent of seven IBM 3033 processors, several hundred IBM 3350 disk drives, a full panoply of printers and other peripherals and a 400-plus programming staff, EBD concluded it would be the least expensive and most cost-effective to go to an outside vendor.

A survey of major DBMS on the market, undertaken by both division and corporate DP staff, narrowed the field to four choices: System 2000 from Intel Corp.; Software AG's Adabas; IBM's DL/1; and the Cullinane Database Systems, Inc. Integrated Database Management System (IDMS).

In the end, EBD made its choice based on two major factors: backup and recovery facilities and a Codasyl network-oriented data base organization. The choice? Cullinane's IDMS, whose building-block Codasyl structure "has made it possible to design large operational data bases, reduce our administrative overhead and implement a variety of complex data structures," according to Bob Yellin, data base administrator for EBD.

The division purchased IDMS-DB in mid-1978. At that time, EBD also purchased Cullinane's Culprit and Online Query (OLQ) packages and has since implemented or enhanced a number of systems using IDMS.

The largest of these is an enhancement to Aecclaims, an on-line application that processes group health claims. Aecclaims presently utilizes four dedicated IBM 3033s operating under MVS and Tcam and approximately 275 IBM 3350 disk drives to process claims transactions from more than 4,000 terminals spread throughout the U.S.

Aecclaims is an interactive system that reportedly processes more than 300,000 IDMS transactions per day. "During our first three months of 13-hour-per-day on-line operation, we didn't experience a single volume-related failure through IDMS," reported Yellin.

Flexibility

It was partly IDMS' flexibility that enabled the smooth installation of Aecclaims, Yellin pointed out. "Thanks to its network structure and well-placed exits, we were able to cleanly implement the procedure under IDMS control — using standard IDMS interfaces and macros — without having to change a single line of internal code," he explained.

In addition to Aecclaims, EBD has implemented several other IDMS-based applications. Aessist is a nationwide on-line system that processes field-supplied census, benefit and customer information on prospect companies and prepares quotations and proposals for use by marketing personnel in group insurance sales.

On-line applications for in-house use include a Claim Reporting System that performs claim validation, draft reconciliation, claim funding and reporting and monitors the wire-transfer of funds between Aetna and customer banks.

"All of EBD's applications are integrated," Yellin said. "They are integrated operationally in that all inputs from one system to the other are automated and closely coordinated. They are true production systems that directly support our daily business activities."

Furthermore, "the schema/subschema relationships designed into the system have noticeably reduced our administrative overhead in that we don't have to build a distinct data base descriptor for every program," Yellin added.

Finally, "the IDMS-DB Directory has been extremely useful as a central repository of data definitions," Lee noted, "and the fact that it is integrated with the Cobol compiler has helped to greatly reduce the data 'pollution' in our primarily Cobol shop."

ARE YOU LOOKING FOR MORE?

MAXIMIZE YOUR EFFECTIVENESS AND INCREASE PRODUCTIVITY WITH DP TRAINING AT

CHUBB INSTITUTE

Training Schedule	Days New York	Days New Jersey	Evenings New Jersey	Tuition Individual	Tuition In-House
IMS TRAINING					
IMS DL/1	Oct. 4-6	Aug. 2-4	Sept. 7-23	$445	$4450
IMS Data Communications	Oct. 7-8	Aug. 5-6	Sept. 28-Oct. 7	$345	$3450
CICS TRAINING (NEW)					
CICS Command-Level Programming	Aug. 9-13	July 26-30 Sept. 20-24	Oct. 18-Nov. 17	$595	$5950
OS/VS TRAINING					
Job Control Language		Aug. 9-11 Oct. 18-20	Sept. 16-Oct. 5	$445	$4450
MVS Dump Debugging	Oct. 4-6	Aug. 16-18	Oct. 12-21	$445	$4450
VSAM in COBOL			Oct. 12-28	$395	$3950
ANS COBOL		July 12-30 Sept. 20-Oct. 8		$975	call registrar
USER TRAINING					
Intro to Data Processing	Sept. 13-14	July 19-20		$175	$1750
Data Processing for the Non DP Executive		Sept. 20-22		$395	$3950
SYSTEMS TRAINING					
Systems Analysis Workshop		Sept. 20-24		$695	call registrar
ENTRY LEVEL TRAINING					
45 Days COBOL Programming		Aug. 9 / Oct. 4	Sept. 8	$3100	call registrar
60 Days COBOL and OS		Aug. 9 / Oct. 4	Sept. 8	$3300	call registrar
75 Days COBOL, OS and Worskhop		Aug. 9 / Oct. 4	Sept. 8	$3500	call registrar

Registration for three or more attendees from the same company per seminar will receive a 10% discount. (Does not include Entry Level Training)

CHUBB

ADVANCED TRAINING CENTER
480 MORRIS AVENUE
SUMMIT, NEW JERSEY 07901

(201) 467-7680

Yes, please send catalog information.

Name/Title _____
Company _____
Address _____
City/State/Zip _____
Telephone _____

☐ OS/VS TRAINING ☐ USER TRAINING
☐ CICS TRAINING ☐ IMS TRAINING
☐ SYSTEMS TRAINING ☐ ENTRY LEVEL TRAINING

CW0682

DEC

VT-131	new	$1250
LA-36	used	$350
LS-120	used	$795

LSI BOARDS PDP MODULES NEW PRICED TO SELL

TI 745	used	$595

TBC Terminal Brokers Co. 2001 West Main St. Suite 204 Stamford, CT 06902

203-964-9331

BRAINWARE™

Easytrieve®: the software that increases the speed of write.

Computer reports move faster when they travel by Easytrieve. Created to eliminate report backlogs, slash wasted programmer-hours, and pacify the impatient user. To go beyond the speed of write. Created by the Pansophic power of innovation that is Brainware.

Easytrieve produces exactly the reports you need—quickly and automatically—using English-like commands. It requires no prior programming experience, yet it works complex logic, does job accounting and systems housekeeping chores, and creates computer graphics. And it's a six-time DATAPRO Honor Roll winner.

Easytrieve interfaces with TOTAL, IMS, DL/1, and IDMS data bases. It's compatible with IBM, Univac, Siemens and FACOM. Prompting facilities are available for TSO, TSO/SPF, CMS, CMS/SPF and ICCF environments. An editing facility for on-line scanning in CICS environments is also available.

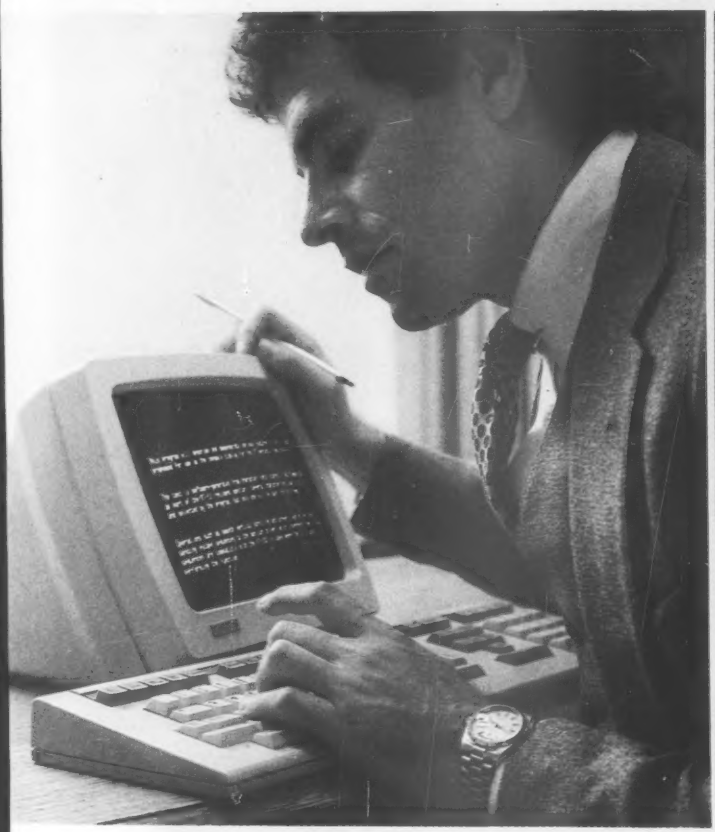
For more information on Easytrieve, Panvalet,® Panexec,® Panaudit™ and Panrisk,™ call (800) 323-7335.

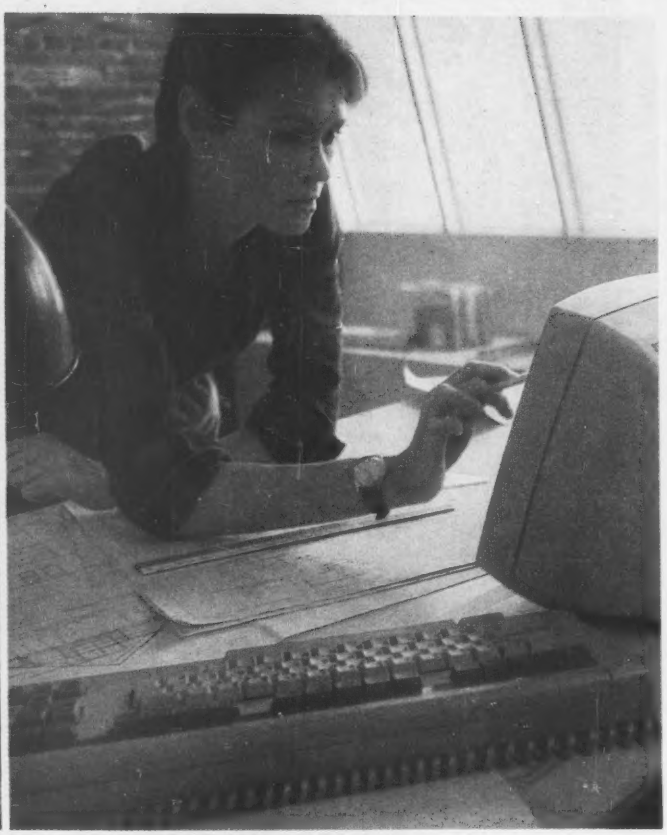
PANSOPHIC

709 Enterprise Drive, Oak Brook, IL 60521

© Pansophic Systems, Inc., 1981

All that personal were a few profes





Until now, manufacturers have made personal computers that were a hopeful compromise between home use and business.

But now Digital Equipment Corporation offers the first personal computers designed —and built—strictly for professional use. And since different professionals have different needs, Digital is introducing not one, but three personal computers made to professional standards.

From keyboards to monitors to software, all three computers are designed to be easy to learn, use, and maintain. They all have the communications capability to get you into larger systems and networks. And they're all backed by the service, support, and quality that have made Digital the second largest computer company in the world.

Digital's Professional 300 Series is a full-blown minicomputer for your desk. It can work on more than one job at a time—just like you do. It can handle text, data, pictures, even voices on the telephone. It gives you photo quality "bit-map" graphics with 4 times the resolution of your home TV.

The Professional 300s include a full multi-tasking operating system that lets you run all applications with the same basic

CP/M is a registered trademark of Digital Research, Inc. Professional, DECmate and Rainbow are trademarks of Digital Equipment Corporation.

computers needed sional standards.

menus, prompts, and help commands.

Digital's DECmate II is the first personal computer that can manage an office. It runs a complete array of professional-quality word processing, list processing, and office management software. Plus many special applications like general accounting, construction, and manufacturing. It can even handle conventional CP/M® programs.

Digital's Rainbow 100 is for the professional who wants to use the wide range of available 8- and 16-bit CP/M personal computer software. For the price of an ordinary personal computer, you get a video screen that's a full 132 characters wide; optional bit-map graphics; and professional-level communications.

For more of the story, call 1-800-DIGITAL.

For personal computers that are as professional as you.

More personal.
More computer.

digital

For 1982 State, National Contests

Information Service for Elections to Start

By Marguerite Zientara
CW Staff

NEW YORK — A computerized information service for the 1982 national and state elections will be initiated this month by the Associated Press and Mead Corp.'s Mead Data Central Division, both located here.

The AP Political Service, a joint venture of AP and the division of Mead Corp., is said to expand the political data bank that was offered by AP in the 1980 elections as a research tool aimed primarily at writers, editors and broadcasters.

At that time, the service was offered by AP and the New York Times Information Service; an AP spokesman declined to comment on the reason for its switch from the Times' service to Mead.

To be updated daily, the service will include information on candidates and issues, as well as background and historical material on primary and general elections for Congress and key state offices. AP bureaus in every state will contribute to the library and material will be coordinated by senior editors here and in Washington, D.C.

Accessible on-line through Mead's Nexis and Lexis information service terminals, the campaign file "will enable users to keep track of candidates and issues, recording the development of campaign strategies and any shifts in position as the Nov. 2 elections approach," according to a Nexis spokesman.

A major feature of the service will be a developing campaign file, which will include most AP political stories filed by state bureaus and the Washington, D.C., staff, coded and cross-referenced by candidate and issue.

Could such a centralized and codified network of information result in homogenized news reports around the country? According to Nexis General Manager Anne Saunier, "Probably not, because political writers have always followed the candidates and elections on their own and have their own views of them.

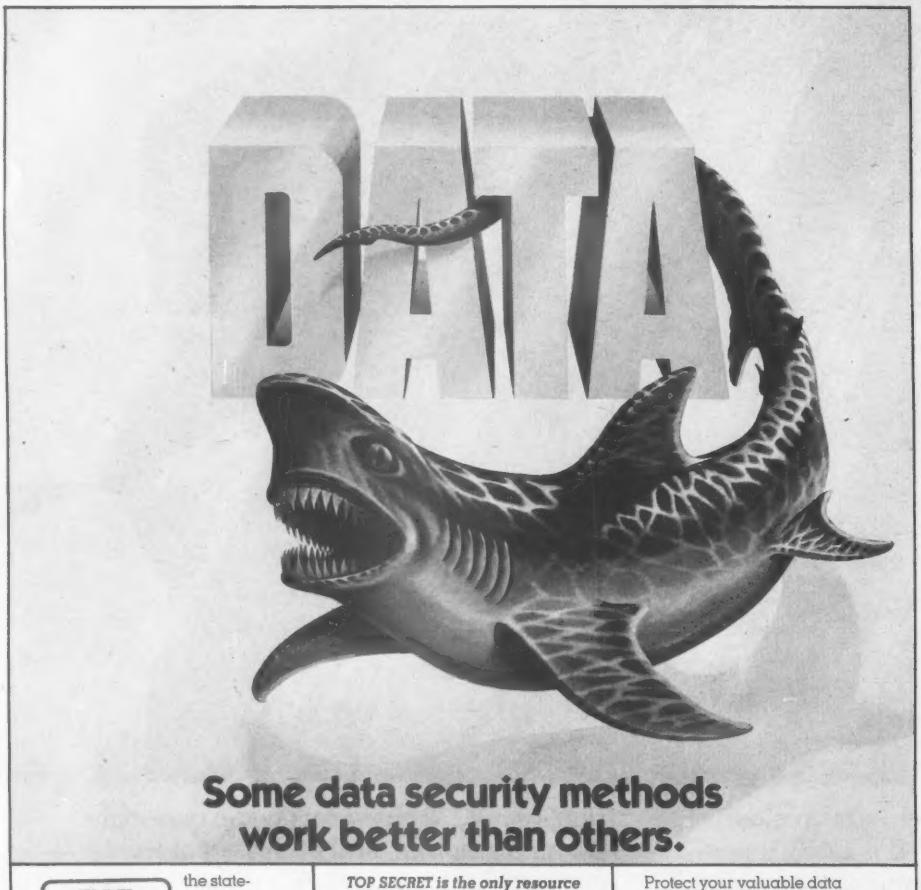
"What I do think this will offer writers across the country, however, is better information on national elections at the local level," Saunier continued. "So that, for example, it would be possible for a smaller city's newspaper or television station to run feature stories on all women candidates across the country, or all Blacks, or all candidates who are over 60 or all elections where the constituency of a district is a certain percentage Hispanic, for example."

Separate Files

In the library, every candidate for Congress and governor will have a separate file, listing biographical and other information. In addition, the service will include separate files for each state, providing summary information on offices at stake, recent election history, candidates and key local or regional issues.

The data bank will also include election schedules, lists of congressional and state house officeholders, candidates' positions on important national issues, election law data and poll results. The library will also include background information on the 1980 presidential election year.

The service is accessible 23 hours per weekday and 14½ hours on weekend days. Cost for the service will be similar to that of Nexis, for which a terminal setup costs $50/mo, with additional on-line pricing, a Mead Data Central spokeswoman said from 200 Park Ave., 43rd Floor, New York, N.Y. 10166.



Some data security methods work better than others.

TOP SECRET the state-of-the-art resource protection package for MVS works best of all.

TOP SECRET is data security at its best. Offering quick installation, phased implementation and comprehensive resource protection, TOP SECRET outdistances all other data security methods for total resource protection.

TOP SECRET immediately secures your most critical resources without impacting normal processing. Implement security with no delay and with absolutely no modifications to your operating system.

TOP SECRET is the only resource protection package that offers totally comprehensive CICS security, including file and program control and protection down to the field level.

By using the Standard MVS Security Interface, TOP SECRET becomes an integral part of your operating system. Complete compatibility with all IBM and vendor products that use Standard Security is automatic and guaranteed, now and in the future.

TOP SECRET security comes with the same top-notch technical support that guarantees the quality and reliability of all CGA software products.

Protect your valuable data resources today. Join the MVS sites across the country that have considered every data security method and made the sure TOP SECRET choice.

Call for additional product information and your free trial.

800-543-7583.
In Ohio, call collect
(513) 890-1200.

cga Software Products Group, Inc.

212 West National Road
Vandalia, OH 45377

Courses Offered For Center Users

LOS ANGELES — CRWTH Computer Coursewares is offering two courses designed for the end users of an information center. The course runs under the IBM Instructional Systems, and materials will reportedly be presented on a terminal using an interactive student/computer dialogue.

The first course, "Introduction to the Information Center," is intended to familiarize the first-time user with the concepts and use of an information center.

At the completion of the course, the user will understand what an information center is, how to use one and how to use a CRT terminal, the vendor claimed.

The course can be leased for $1,200 yearly.

The second course, also aimed at the information center user, is called "Developing DP Skills for End Users." It reportedly provides the student with an introduction to the programming concepts needed in using the new user languages, the tools often found in an information center. Emphasis is on practical problem solving using DP functions common to most tools.

The course can be leased for $2,100 yearly, CRWTH said from Suite 205, 12655 Washington Blvd., Los Angeles, Calif. 90066

MANTIS
CINCOM'S POWERFUL 4th GENERATION LANGUAGE...

SETS NEW PERFORMANCE STANDARDS IN APPLICATION DEVELOPMENT TECHNOLOGY.

MANTIS is the most powerful application development system ever offered.

The power of MANTIS comes from its unique 4th Generation Language, combining the flexibility of modern procedural languages and the power of interpretive systems.

Procedural: MANTIS is procedural, providing the flexibility to solve even the most complex types of applications in a logical, straight-forward manner.

Interpretive: MANTIS is interpretive, thus eliminating the frustrating delays of multiple compile steps which can stop productivity in its tracks. And MANTIS' processing efficiency compares favorably to COBOL due to its advanced interpretive parser.

Complete Application Development: MANTIS provides complete beginning-to-end on-line application development tools. They include:

- Free-form interactive screen design
- Conversational file design and allocation
- Logical data views
- Conversational programming with MANTIS' 4th Generation Language
- On-line documentation
- Computer aided instruction facilities
- Directory listings (maintenance is automatic through the library system)
- Master terminal security controls
- Menu driven operation
- Independence to access any existing files or data bases
- On-line hard copy
- Dynamic screen attribute modification
- Full set of batch utilities
- High level Cincom DBMS and VSAM file support.

MANTIS' unique design enables programmers to use the most contemporary development techniques such as top down design, step level refinement, structured coding and prototyping.

In the past 12 months, more than 400 companies worldwide have chosen the power of MANTIS to improve their application development performance. New levels of performance never before achieved.

Procedural, Interpretive, Powerful, Successful. This is MANTIS—the 4th Generation Language—the complete application development system.

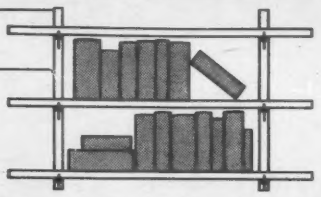
But, the only way to appreciate the power of MANTIS is to see it in action. To arrange a demonstration, contact our Marketing Services Department.

800-543-3010 In Ohio: 513-661-6000
In Canada: 416-279-4220

Cincom Systems

2300 Montana Ave. Cincinnati, OH 45211

Off the Press



With the exception of the fiction review, this month's column is devoted to books on word processing and office automation.

WORD PROCESSING: Concepts and Careers, Second Edition
By Marly Bergerud & Jean Gonzalez

In its first edition, this was one of the first books on word processing. In its new edition, it is one of the best introductions to the subject available. The authors stress that people, procedures and equipment *together* create a word processing environment. Chapters on input, output, reprographics and distribution culminate in a chapter on creating a system. Subsequent material discusses jobs and career paths.

Softcover, 237 pages, $16.95, ISBN 0-471-06010-0. John Wiley & Sons, 605 Third Ave., New York, N.Y.10158.

WORD PROCESSORS AND INFORMATION PROCESSING
By Dan Poynter

"We have conserved and automated everywhere but the office," the author states, and he offers practical advice from a user's — not a technician's — viewpoint. This book offers very practical advice for determining needs (for example, discussing a dot matrix printer typeface without descenders or how storage is configured on disks). The book covers specific machines, systems and how to comparison shop in great detail. The last 30 pages thoroughly detail sources for further information.

Softcover, 170 pages, $11.95, ISBN 0-915516-31-4. Para Publishing, P.O. Box 4232-88, Santa Barbara, Calif. 93103.

WORD PROCESSING AND OFFICE AUTOMATION
By Gilbert J. Konkel & Phyllis J. Peck

This book gets down to the business of managing and supervising the word processing function in the lively and interesting form of conversations between people. The dialogue moves through basic aptitudes necessary to manage, identifies problems, presents ways to prepare for managing and goes on to designing a WP system, buying equipment and staffing. This is a definitive work on how to move yourself and your organization ahead.

Softcover, 168 pages, $12.95, ISBN 0-911054-05-7. Office Publications, Inc., 1200 Summer St., Stamford, Conn. 06904.

HUMAN FACTORS IN OFFICE AUTOMATION
By Wilbur O. Galitz

This book goes beyond simplistic ergonomics to discuss how people and office automation contribute to a more successful organization. Job enrichment, information gathering and management, the social environment and office design are covered in detail. Guidelines, considerations and tradeoffs are clearly spelled out. The book concludes with a chapter on managing change.

Softcover, 237 pages, $16.00, ISBN 0-89435-089-7. A publication of the Life Office Management Association, distributed by Q.E.D. Information Sciences, Inc., P.O. Box 181, Wellesley, Mass. 02181.

OFFICE AUTOMATION: A Survey of Tools and Technology
By David Barcomb

This delightfully illustrated book examines office automation systems: word management (word processing), electronic mail, electronic calendars, micrographics, teleconferencing and graphics. It examines each both separately and as components of an integrated office automation system. Two interesting chapters cover the individual workstation and home and portable offices. The material on developing and implementing a master plan is good, especially the "3 Ps" (prototype, pilot and production) Strategy. The book is clearly and interestingly written and discusses not only the systems of today, but those of tomorrow as well.

Softcover, 241 pages, $15.00, ISBN 0-932376-16-9. Digital Press, 12 Crosby Drive, Bedford, Mass. 01730.

SILENT WITNESS
By Ed Yourdon

This is a work of gritty realism, set in New York and involving a computer scam that could really happen. Max and Tony, a programmer and an operator, contrive to embezzle $3 million from the bank they work for, and it's going smoothly until Tony decides to triple the take in a deal for hard drugs. Enter Bernie, the innocent bystander, and add Hogie, a bright systems analyst, and Andrea, a beautiful antiestablishment cop. Stir in some great computer sleuthing, and the end result is an admirable first novel.

Hardcover, 177 pages, $12.95, ISBN 0-917072-28-6. Yourdon Press, 1133 Ave. of the Americas, New York, N.Y. 10036.

YOU WANT IT...
WE'VE GOT IT!

SNA/SDLC capability at a Control Concepts price.

The SDLC CC-3276 is only $3350

For further information call 800-368-3078.

CONTROL CONCEPTS
a division of PRESEARCH Incorporated

2361 S. Jefferson Davis Hwy
Arlington, VA 22202
(703) 553-2910

225 Broadway, Suite 1810
San Diego, CA 92101
(714) 235-6721

MRPS

"CINCOM'S MANUFACTURING CONTROL SYSTEM– WORKS AS WELL FOR MANUFACTURING AS IT DOES FOR DATA PROCESSING."

Today's successful implementations of manufacturing control software have two things in common:

1. They work as hard for manufacturing in reducing inventories, improving on-time deliveries and profit margins as they do for data processing in being powerful, adaptable, extendable and flexible to the changing needs of manufacturing.
2. They are based on Cincom's MRPS, the comprehensive production and inventory control software system that is modular, integrated and flexible.

Designed by Cincom's R&D teams along with a number of the manufacturing industry's premier consultants, Cincom's Manufacturing Resource Planning System (MRPS) is the first of the next generation of manufacturing control systems. A generation that works as well for manufacturing as it does for data processing. Cincom's MRPS is the first manufacturing control system that is:

- Designed to adapt to change in manufacturing operations
- Modular, yet integrated, for phased implementation
- Integrated with a DBMS to ensure data independence and high performance
- Hardware/software independent and portable from mainframes to minicomputers
- Designed exclusively for an on-line environment.

As the first manufacturing control system to be designed, built and proven in actual use in the last decade, Cincom's MRPS combines the most recent manufacturing MRP principles with the most contemporary data processing methodologies.

The System is comprised of five powerful modules. The Foundation Module establishes the system framework and the information base. The four planning modules include: MMPS—Manufacturing Material Planning System; MPSS—Master Production Scheduling System; PPCS—Production Planning and Control System; and VAPS—Vendor Analysis and Purchasing Systems.

With this fully integrated system, manufacturers are realizing performance results that no other system can match. Results that include:

- Inventory levels reduced 30%
- Overtime cut by 55%
- Inbound freight charges reduced 30%
- Indirect labor productivity improved 30%
- Inventory accuracy increased to 95%
- On-time delivery improved to 99%
- Overdue purchase orders reduced 44%

Using MRPS, your company too can look forward to lower investments in inventories, timely customer service, and more efficient production. All of which adds up to greater customer satisfaction and higher profitability.

Cincom's MRPS. It's the manufacturing control system that allows manufacturing and data processing to work as a successful team. And it's fully integrated with Cincom's complete line of DB/DC and directory driven information software.

For our full-color booklet on how MRPS can become a major step in optimizing your manufacturing environment, contact our Marketing Services Department:

800-543-3010

IN OHIO: 513-661-6000 IN CANADA: 416-279-4220

Clearly the leader in data base and software technology.

Cincom Systems

2300 Montana Ave. Cincinnati, OH 45211

Increase your ability to meet tomorrow's challenges

Datapro Seminars | May through August 1982

Includes five conferences and the eight-day Data Communications Institute sponsored by *Data Communications* Magazine.

Data Communications Series

Explores data communications network structures, applications, techniques, and technologies with a focus on applying them to their maximum potential in your operations.

Data Communications: An Introduction to Concepts and Systems

MAY	24-26	DENVER
JUNE	2-4	NEW YORK
JUNE	28-30	CHICAGO
JULY	7-9	TORONTO
JULY	12-14	SAN FRANCISCO
JULY	19-21	WASHINGTON
AUG.	2-4	DALLAS
AUG.	2-4	NEW YORK

Data Communications: Advanced Concepts and Systems

MAY	17-18	CHICAGO
JUNE	7-8	TORONTO
JUNE	10-11	HOUSTON
JUNE	14-15	SAN FRANCISCO
JUNE	24-25	NEW YORK
JUNE	28-29	DENVER
JULY	15-16	WASHINGTON
AUG.	9-10	CLEVELAND

Data Communications: Effective Network Design

MAY	19-21	CHICAGO
JUNE	16-18	SAN FRANCISCO
JUNE	21-23	NEW YORK
JULY	14-16	WASHINGTON
AUG.	9-11	LOS ANGELES

Teleprocessing Software: An Introduction to Concepts, Systems and Applications

JUNE	2-4	CHICAGO
JUNE	21-23	SAN FRANCISCO
JUNE	28-30	NEW YORK
JULY	12-14	WASHINGTON

Distributed Systems: Effective Approaches and Applications

MAY	24-26	CHICAGO
JUNE	7-9	WASHINGTON
JULY	7-9	SAN FRANCISCO
JULY	14-16	NEW YORK

IBM's Systems Network Architecture: A Master Plan for Teleprocessing

MAY	20-21	WASHINGTON
JUNE	17-18	CHICAGO
JUNE	24-25	SAN FRANCISCO
JULY	8-9	NEW YORK

Telecommunications Management: Cost Reduction Techniques

MAY	24-26	NEW YORK
JUNE	7-9	CHICAGO
JUNE	28-30	WASHINGTON
JULY	14-16	SAN FRANCISCO
AUG.	2-4	DENVER

Systems and Software Series

Addresses a broad range of practical considerations in the establishment and maintenance of systems, including data base management, data administration, data dictionaries/directories, and data security. Provides in-depth analysis of software evaluation, selection, and maintenance.

Information Systems Planning: A Structured Approach

JUNE	2-4	DALLAS
JUNE	14-16	SAN FRANCISCO
AUG.	9-11	WASHINGTON

Systems Analysis and Design: Concepts and Effective Practice

MAY	19-21	SAN FRANCISCO
JUNE	2-4	WASHINGTON
JUNE	16-18	HOUSTON
JUNE	28-30	CHICAGO
JULY	12-14	NEW YORK
AUG.	9-11	DENVER

Structured Systems: Analysis, Design and Programming

MAY	19-21	CHICAGO
JUNE	2-4	NEW YORK
JUNE	28-30	SAN FRANCISCO
AUG.	4-6	WASHINGTON

Computer Software Packages: Evaluation and Selection

MAY	24-26	WASHINGTON
JUNE	7-9	SAN FRANCISCO
JUNE	16-18	NEW YORK
JULY	7-9	CHICAGO

Structured Testing: Tools and Techniques

JUNE	9-11	CHICAGO
JUNE	14-16	DALLAS
JUNE	28-30	SAN FRANCISCO
JULY	12-14	NEW YORK

Data Base Management Systems: General Concepts and Guidelines

MAY	24-26	LOS ANGELES
JUNE	7-9	NEW YORK
JUNE	14-16	SAN FRANCISCO
JUNE	21-23	CHICAGO
JULY	14-16	WASHINGTON

Data Base Management Systems: A Comparative Analysis of General Purpose Systems

MAY	17-19	WASHINGTON
JUNE	2-4	SAN FRANCISCO
JUNE	7-9	CHICAGO
JULY	7-9	NEW YORK
JULY	12-14	DALLAS

NEW
Data Administration: Successful Techniques

MAY	17-18	NEW YORK
MAY	24-25	SAN FRANCISCO
JUNE	28-29	CHICAGO
JULY	8-9	WASHINGTON

Data Dictionary/Directory Systems: Evaluation and Selection

MAY	20-21	NEW YORK
JUNE	14-15	SAN FRANCISCO
JULY	12-13	CHICAGO
AUG.	2-3	WASHINGTON

Data Security: Implementation and Management

MAY	19-21	NEW YORK
JUNE	16-18	SAN FRANCISCO
JULY	14-16	CHICAGO
AUG.	4-6	WASHINGTON

NEW
Structured Maintenance: Reducing Costs with a New Methodology

MAY	24-25	NEW YORK
JUNE	10-11	SAN FRANCISCO
JUNE	28-29	CHICAGO

EDP Management Series

Incorporates the latest methods, procedures, and techniques of sound operations management into practical learning formats that help EDP managers improve performance and productivity at all levels.

EDP Operations Today: Effective Scheduling and Console Operation

MAY	24-26	SAN FRANCISCO
JUNE	9-11	NEW YORK
JUNE	23-25	WASHINGTON
JULY	12-14	CHICAGO

Computer Operations Management: Effective Techniques

MAY	24-26	NEW YORK
JUNE	9-11	CHICAGO
JUNE	28-30	SAN FRANCISCO
JULY	14-16	WASHINGTON

Computer Performance Measurement and Capacity Planning: Tools and Techniques

JUNE	7-9	CHICAGO
JUNE	14-16	WASHINGTON
JUNE	21-23	SAN FRANCISCO
JULY	19-21	NEW YORK

EDP Project Management: A Practical Approach

MAY	24-26	WASHINGTON
JUNE	14-16	SAN FRANCISCO
JULY	12-14	NEW YORK
JULY	19-21	CHICAGO
AUG.	2-4	LOS ANGELES

Advanced EDP Management: Methods and Techniques in the 80's

MAY	24-26	NEW YORK
JUNE	9-11	SAN FRANCISCO
JUNE	23-25	CHICAGO
JULY	12-14	WASHINGTON
AUG.	2-4	BOSTON

Word Processing/Office Automation Series

Provides practical guidelines for WP/Office Automation system planning and selection, and stresses effective methods for implementing and integrating the functions within an organization.

Introduction to Word Processing: Concepts, Systems and Applications

MAY	17-19	WASHINGTON
JUNE	14-16	NEW YORK
JUNE	21-23	SAN FRANCISCO
JULY	12-14	CHICAGO
AUG.	2-4	ATLANTA

Word Processing: Effective Operations Management

MAY	17-19	NEW YORK
JUNE	14-16	WASHINGTON
JUNE	21-23	CHICAGO
JULY	12-14	SAN FRANCISCO

Integration of Word Processing and EDP Systems

MAY	24-26	SAN FRANCISCO
JUNE	28-30	NEW YORK
JULY	7-9	CHICAGO
AUG.	2-4	WASHINGTON

Planning for Office Automation: Concepts and Practices

MAY	19-21	CHICAGO
JUNE	2-4	WASHINGTON
JUNE	7-9	BOSTON
JUNE	28-30	SAN FRANCISCO
JULY	12-14	NEW YORK

General Seminars

These seminars provide an introductory look at data processing, minicomputers, and microcomputers with an emphasis on profitable implementation. Successful applications of CAD/CAM and computer graphic techniques are also explored.

Data Processing: Fundamental Concepts

MAY	24-26	SAN FRANCISCO
JUNE	9-11	WASHINGTON
JULY	7-9	CHICAGO
JULY	12-14	NEW YORK
AUG.	9-11	LOS ANGELES

Minicomputer Systems: Guidelines for Successful Selection, Acquisition and Operation

MAY	24-26	NEW YORK
JUNE	14-16	CHICAGO
JUNE	28-30	SAN FRANCISCO
JULY	14-16	WASHINGTON

BASIC: An Introduction to Computer Programming for Managers

JUNE	2-4	WASHINGTON
JULY	7-9	SAN FRANCISCO

Using Computer Graphics: Techniques, Systems and Applications

JUNE	2-4	NEW YORK
JUNE	28-30	SAN FRANCISCO

NEW
Microcomputer Systems: A Guide to Selection and Application

MAY	17-19	NEW YORK
JUNE	21-23	CHICAGO
JULY	12-14	DALLAS

NEW
Using CAD/CAM Systems: Planning, Equipment Selection and Applications

JUNE	7-8	NEW YORK
JULY	8-9	SAN FRANCISCO
AUG.	9-10	CHICAGO

Data Communications Magazine Programs

Includes five conferences and the eight-day Data Communications Institute sponsored by *Data Communications* Magazine.

Data Communications Institute: Basic Data Communications

JUNE	14-23	CHICAGO

DDP Network Architecture: Advanced Concepts

JUNE	21-23	SAN FRANCISCO
JULY	12-14	WASHINGTON

Speech Coding: Principles and Practices

JUNE	14-16	DALLAS

Software Quality Assurance and Configuration Management

JUNE	21-22	NEW YORK

Network Cost Management

JUNE	3-4	SAN FRANCISCO
JUNE	14-15	NEW YORK

Computer Terminal Selection: Guidelines for Meeting Productivity Goals

JULY	12-13	WASHINGTON
AUG.	2-3	DALLAS

Check your Datapro Seminar Catalog for full course outlines, schedules and details. (If you have not received your copy, use the coupon or call our toll-free number below.) You can also call for instant enrollment or for more information.

Request a free subscription to *Seminar News* for helpful tips and reminders.

Call 800-257-9406.

(In New Jersey, 609-764-0100.)

information that leads to action

datapro

DATAPRO RESEARCH CORPORATION
1805 Underwood Boulevard
Delran, New Jersey 08075
A McGraw-Hill Company

Registration Fees:
Datapro Seminars: $640 for current Datapro subscribers, $690 for non-subscribers
Data Communications Institute: $1450 for current Datapro subscribers, $1600 for non-subscribers
Data Communications Conferences: $640 for current Datapro subscribers, $690 for non-subscribers

☐ Please register the following person in the program(s) indicated below:

Program _____
City _____ Date _____
Attendee Name(s) _____

Program _____
City _____ Date _____
Attendee Name(s) _____

☐ Please send me a free Datapro Seminar Catalog.
☐ Please send me a free subscription to *Seminar News*.
☐ Please contact me about Datapro's In-house Seminars.

Name _____
Title _____
Organization _____
Address _____
City _____ State _____ Zip _____
Telephone _____
☐ Datapro Subscriber ☐ Non-subscriber

SSSC CW 6/14

Effective Language Interface Focus of Test by NYU Team

By Brad Schultz
CW New York Bureau

For an experiment designed to discover whether users work more effectively with natural or artificial languages (see related story on Page 50), five New York University (NYU) computer scientists selected as subjects an applications-oriented user population that seemed most likely to benefit from natural language as an interface medium.

Their strategy was to build a system featuring a natural language interface that worked well with the initial subjects, and then to see how successful the interface would be when applied to other applications and user types.

Further, the NYU team decided to implement the same primary application in a system featuring an artificial interface language, and then to see how end-user performance with that system compared with performance with the first system.

They chose eight people associated with NYU's Graduate School of Business Administration — by some accounts, the nation's largest business school — as subjects of their experiment. The primary application under study was that served by the school's Alumni Information System, which runs in 8M bytes of virtual memory on an IBM 4341 Group I system under VM/CMS and is accessed remotely via teleprinters over 300 bit/sec dial-up lines.

The eight subjects had a mean age of 24.4 years and, in each case, little prior experience with computing.

The basis of the natural language application system was the User Specialty Language (USL) developed by IBM's Scientific Center in West Germany. USL maps natural language queries to a data base interface language called SQL, the NYU computer scientists pointed out. SQL and its predecessor, a language called Sequel, had been extensively studied from various standpoints, so SQL was picked as the basis of the artificial language application system.

The subjects were randomly divided into USL and SQL groups, given time to become proficient in their respective interface languages and then tested for proficiency. SQL users slightly edged USL users in performance, but reportedly not enough to substantiate generalized predictions of behavior.

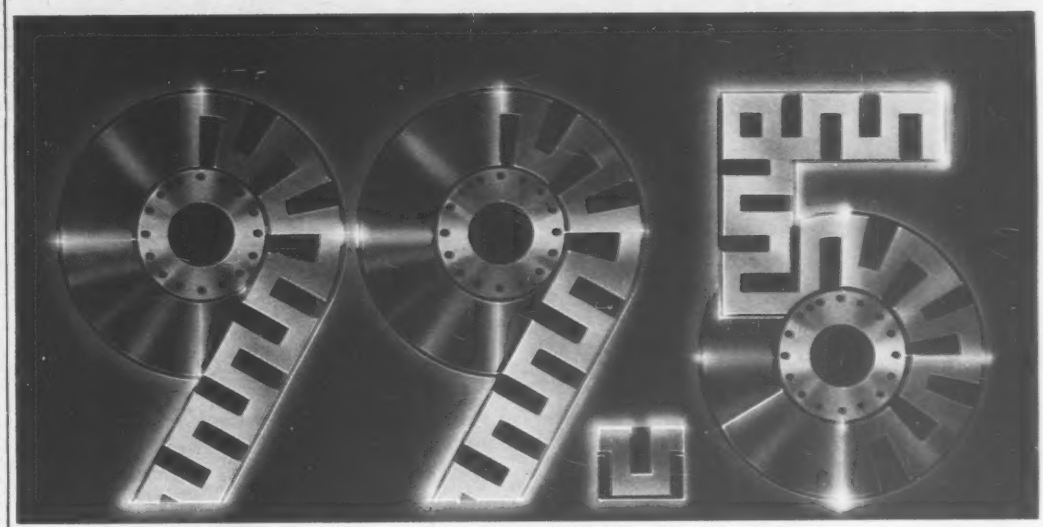
Experiment results indicate a natural language interface is more appropriate for certain applications, while an artificial language interface is more appropriate for other applications, the computer scientists concluded. SQL, which represented the artificial language camp, seems better suited to "medium complexity" question answering, they said.

Moreover, the results suggest that USL, which represented the natural language camp, is more effectively employed when users have undergone a certain amount of training. That negates one of the cardinal benefits natural language interfaces have been claimed to provide, the researchers observed.

ANOTHER QWIKTERM SPECIAL

Diablo 630
only $2295
Letter quality printer, full blown with word processing enhancements
Three Month Leases Available

• Boston (617) 246-1665
• Chicago (312) 595-7733
• Los Angeles (213) 417-8003
• New York (212) 564-7731
• San Francisco (415) 461-0923
• Wash., D.C. (703) 522-1210



Data 99.5% pure.

Now digital data communication of guaranteed accuracy and unprecedented reliability is available in more than 350 cities.

It is DATAPHONE® Digital Service, a major development of the Bell network, the world's largest and most advanced information management system.

With DATAPHONE Digital Service, your data system handles more data, clean data, day in and day out. Bell guarantees better than 99.5% error-free seconds transmitting at 56,000 bps and even greater accuracy at slower rates. Reliability is designed in. If needed, troubleshooting and service are handled quickly by the Bell System from a central location. You get more use from your system without adding costly hardware.

When your system is digital from end to end, there are no losses of quality due to signal conversion or amplification. Re-transmission is virtually eliminated.

You'll find that when your data system is more efficient, accurate and reliable, you can respond faster, serve your customers and users better, manage better.

Discuss with Bell how DATAPHONE Digital Service can serve your needs. All you have to do is call now, 1 800 821-2121, toll free. 1 800 821-2121

Put our knowledge to work for your business. Bell System.

The knowledge business

Artificial or Natural?

NYU Scientists Sift Results in Language Study

By Brad Schultz
CW New York Bureau

NEW YORK — Do system users interact more effectively with an artificial or a natural language?

At a recent symposium here, five New York University (NYU) computer scientists described their experiments aimed at answering that question. Field results are still being evaluated, they noted, but preliminary findings cast doubt on the notion that making an interface language easier to learn will result in more effective utilization of computer systems by end users.

NYU's Jon A. Turner, Matthias Jarke, Edward A. Stohr, Yannis Vassiliou and Norman White presented their research results to a symposium on user interfaces sponsored by the private university's Graduate School of Business Administration. The experiments were conducted with some assistance from IBM's Information Systems Group in White Plains, N.Y.

Linguists and computer scientists have long debated whether formal artificial languages — modeled, for example, on symbolic logic — provide more benefits when applied to problem solving and programming than a natural language modeled on the way humans speak, the five researchers observed.

The central assumption in arguments that natural language is the most appropriate medium for user interfaces seems to be that natural language would make a system accessible to novice users without requiring them to be technically trained for usage, the NYU team reported.

Ambiguity and Vagueness

Arguments against natural language as a medium for user interfaces seem based on the observation that normal human discourse is fraught with ambiguity and vagueness, as well as the observation that taken out of context, phrases are unintelligible, the researchers pointed out.

Moreover, University of Maryland's Prof. Ben Shneiderman has asserted that natural language user interfaces encourage users to "make requests beyond the language, data or knowledge boundaries of the system."

Shneiderman has also argued that the structure of an artificial language may aid in problem formulation, the research team noted.

But another scientist, IBM's L.A. Miller, has countered that because individuals approach problem solving in different ways, some users would be less effective if they were compelled to employ any particular artificial language in interfacing a system.

Comments on Debate

The symposium contributors made several comments on this debate, based on published research and their own experiences.

First, they said the appropriateness of natural language as a user interface largely hinges on the kind of processing that is the system's primary application.

"We suspect that for procedural programming, natural language is too ambiguous and verbose to be effective," they said.

On the other hand, they said, natural language may be useful as a medium for interfacing "questioning-answering systems," where such systems:

- Accept natural language statements as input.
- Transform statements into formal language through a process of syntactic and semantic analysis.
- Provide reasoning procedures for such operations as question answering.
- Generate answers as natural language character strings.

In addition to this, the NYU researchers noted evidence that the skill level of the user has much to do with whether natural language is well-suited as an interface to systems.

If you think nothing much has happened in software since our last software *Extra!*, wait 'til you see September's

This September 1st you'll be getting an entire issue of *Extra!* devoted to software — the driving force that's re-shaping the computer marketplace. In 1980, software revenues were $5,090,000,000. By 1985, International Data Corporation (IDC) predicts that they will reach $16,885,000,000.

Software is taking an increasingly larger share of EDP budgets. Actual 1981 spending for software was 30% higher than for 1980 — a 5% higher growth in spending than had been planned. And this was in a year when nearly all other spending was *less* than had been anticipated.

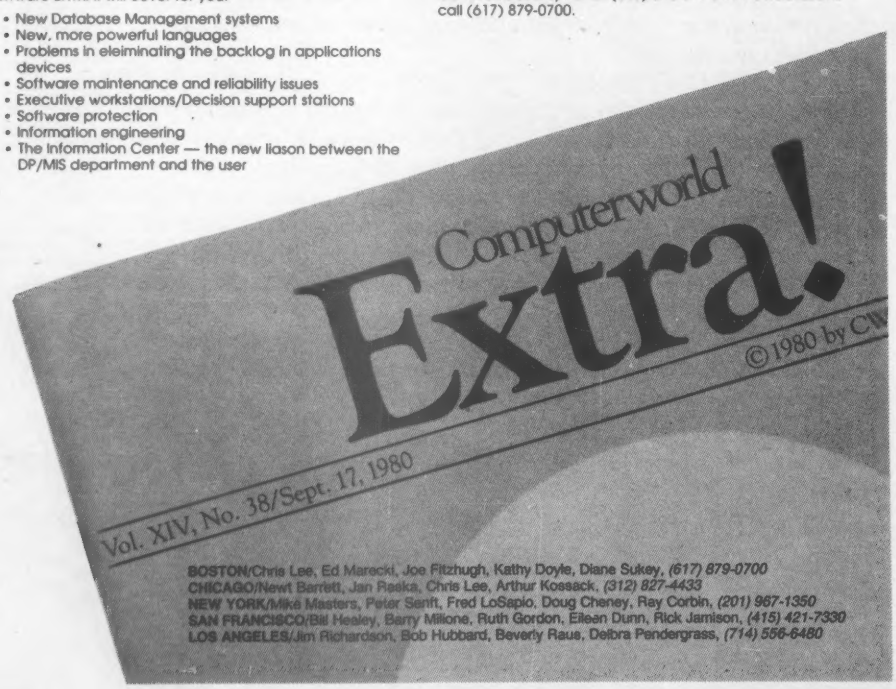
But the real story is not software's increasing importance in EDP budgets, it's the rapidly-changing software environment. And September's *CW Extra!* "The Changing Software Environment" gives you survival techniques and the skills and tools you need to stay involved in the the changing flow of information that the new software is generating. Here's just some of what this September 1st software *EXTRA!* will cover for you:

- New Database Management systems
- New, more powerful languages
- Problems in eleiminating the backlog in applications devices
- Software maintenance and reliability issues
- Executive workstations/Decision support stations
- Software protection
- Information engineering
- The Information Center — the new liason between the DP/MIS department and the user

And, you'll get a new feature this *Extra!* — the software roundtable. You'll get a discussion on optimizing the software resource with DP Manager Joseph Allard; Software Maintenance Expert Carma McClure; Applications Development Expert Denis Connor and Service Bureau/Time Sharing Expert Richard Crandall.

If you sell to Vice Presidents, Directors, DP Managers and other MIS professionals, here's where you'll find your buyers this September 1st. *Computerworld Extra!* will be read by more than half-a-million computer-involved readers including 116,988 paid subscribers, (ABC 12/31/81) and 423,720 pass-along readers (Becker Research Corporation).

CW Extra! advertising close is July 23 and we'll be glad to give you more advertising information — as well as complete details on our subscribers and readers. Just contact your local *Computerworld* sales office, or, call Frank Collins, Display Advertising Manager, CW Communications/Inc. at (800) 343-6474. In Massachusetts call (617) 879-0700.



IWP Fall Meet Set for Phoenix

WILLOW GROVE, Pa. — The International Information/Word Processing Association (IWP) is making plans for its 1982 fall and Canadian symposia, which will be held Nov. 9-11 in Phoenix and Nov. 30 through Dec. 2 in Montreal, respectively.

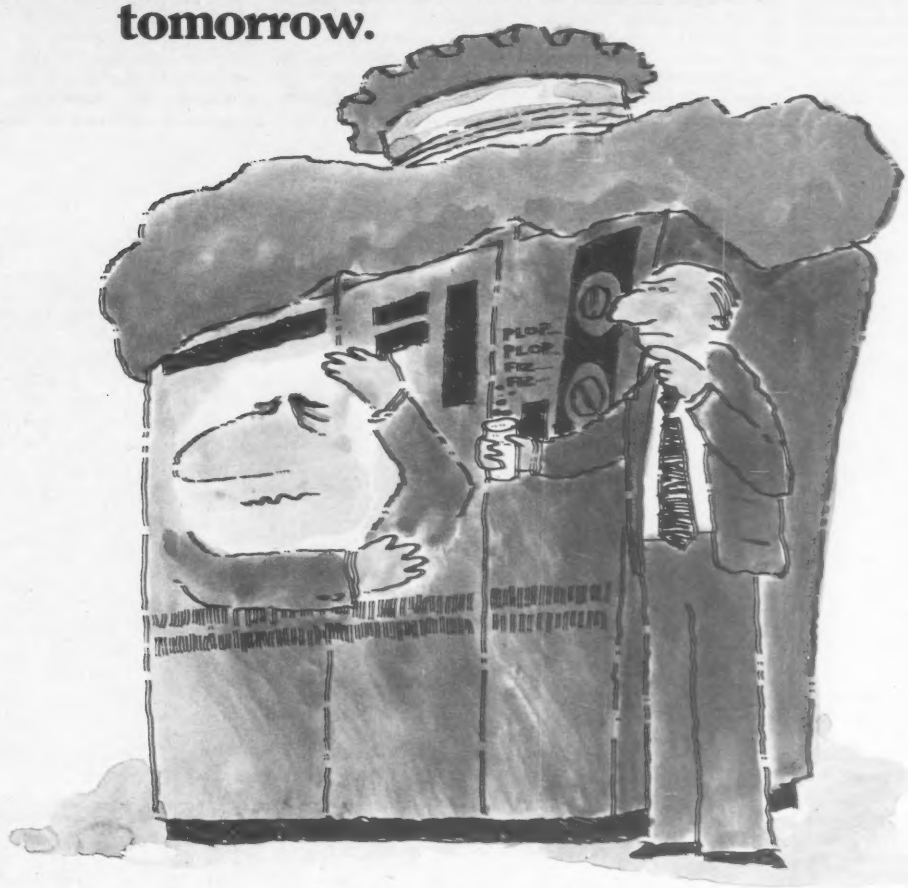
In addition, IWP announced it has revised its yearly conference schedule. There will be no spring symposium in 1983. Following the 1982 Canadian symposium, the next conference will be Syntopican XI in San Francisco in June 1983, according to IWP.

Thereafter, IWP will sponsor a conference in a warm-weather climate in January/February, Syntopican and a Canadian symposium, eliminating the fall symposium.

IWP is located at 1015 N. York Road, Willow Grove, Pa. 19090.

Some data base management systems are like cheap wines.

Unpleasant today and a headache tomorrow.



To avoid such disappointment, consider ADABAS from Software AG. It's the DBMS you can count on to live up to your expectations—now, and in the years to come.

ADABAS can be enjoyed immediately. There's no installation delay because there's no need to predefine all the rules for data usage or to preestablish all possible data relationships. ADABAS' inverted list architecture lets you access data directly and immediately. You can install the system and begin to load your data in just one day.

The more you use ADABAS, the better it gets. The way ADABAS stores data takes the headache out of dealing with change. By completely separating the data and index structures, ADABAS lets you change the way to view data without changing the way the data is stored.

ADABAS can be used for any occasion. It contains DBMS access tools for virtually all corporate information needs. Included are: ADASCRIPT+, an online inquiry language; ADACOM, a batch report writer; ADAMINT, a host language interface; and an integrated, online data dictionary. For instant application development, you can add NATURAL, our program development language, and cut development time up to 90%.

ADABAS for your IBM processor, ADABAS-M for VAX/PDP. Use the coupon to arrange for a tasting, or to attend one of our free seminars.

software AG
OF NORTH AMERICA, INC

Software AG, of North America, Inc.
11800 Sunrise Valley Drive, Reston, Virginia 22091
(703) 860-5050

☐ I would like to arrange for an ADABAS tasting.

☐ Please send me information on your free seminars.

Name _____

Title _____

Company _____

Address _____

City _____ State _____

Zip Code _____ Telephone ( ) _____

CPU _____ Operating System _____

CW0614

Managers on the Move

JOHN P. SINGLETON has been appointed senior vice-president for the central information services in automated data processing at Security Pacific National Bank in Los Angeles. He is responsible for the centralized design and implementation of the bank's automated systems, including teleprocessing and interactive computing.

Prior to joining Security Pacific, Singleton was executive vice-president for operations data processing at Maryland National Bank.

John P. Singleton

Singleton began his career in aerospace data processing with the Apollo program and satellite systems. He joined the Federal Reserve Board of Washington, D.C., as chief operating officer for data processing. He later served as senior vice-president for data processing for Security National Bank in New York and as president of a data processing subsidiary for Great Western Savings and Loan.

Singleton is vice-chairman of the Data Processing Committee for the American Bankers Association and a member of the Information Systems Council for the American Management Association. He received a B.A. degree in business and industrial management from Arizona State University.

•••

JON C. DELL'ANTONIA has been elected vice-president of the Management Information Services Division of Coleman Co., Inc., based in Wichita, Kan. Prior to his recent appointment, he served as director of the division.

Before joining the company, Dell'Antonia was director of information services for General Portland, Inc., Harte-Hanks Communications and, most recently, Seaboard Allied Milling.

Jon C. Dell'Antonia

He graduated from Pittsburg State University with a B.S. degree in business administration.

•••

ROGER T. LEONARD has been promoted to director of management information systems for Sabine Corp., headquartered in Dallas.

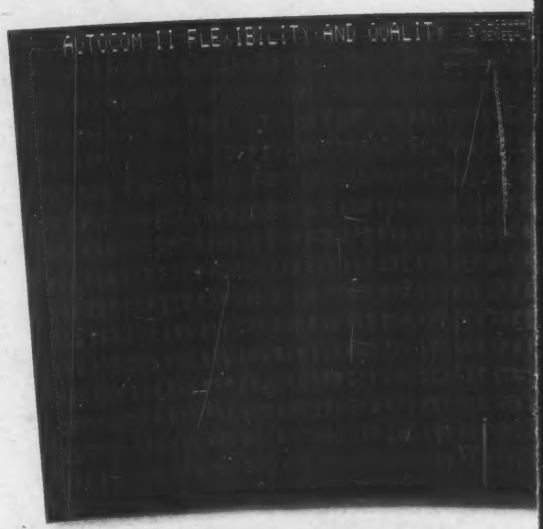
Prior to joining the company, Leonard worked in a similar capacity with Placid Oil Co. Before that, he held various managerial positions with Trans World Airlines, Inc.

He holds a B.A. from Kansas State University and an MBA from the University of Kansas.

•••

FRANK DIASPARRA has joined Compro Associates in New York as manager of technical consulting. In this new role, Diasparra will be managing a consulting group that provides a range of specialized services to the corporate data center, information center and time-sharing environment.

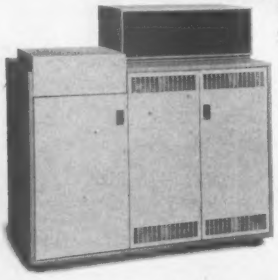
Diasparra comes to Compro from Pepsico, Inc., where he managed the implementation and growth of their time-sharing facility and corporate information center. Before that he held various technical positions with Citibank and Union Carbide.



WET OR DRY.

As an information management and retrieval system, computer output microfilm gives you control of massive amounts of information in a small amount of space. In fact, each microfiche can contain up to 288 times more data than a printed computer page.

For almost 30 years, companies have been turning to DatagraphiX for their COM needs. Because our systems give them a return on investment that simply can't be equalled by other methods of output. A minimum of 35% should be attained in the first year alone. Plus, we give you something other COM companies don't: choice.



Whether you want the archival benefits of wet process systems, or the convenience of dry process systems, DatagraphiX is the source to come to. Our AutoCOM systems are the world's most popular COM recorders—easy to use,

Managers on the Move

MARGUERITE P. FARBER has been named a vice-president in Crocker Bank's Services Management Division in San Francisco. In this capacity she supervises systems planning and control in the computer systems development area, which includes systems quality assurance, financial and business planning, technical education and office systems.

Previous to joining Crocker, Farber was an assistant vice-president and systems manager for Morgan Guaranty Trust. Prior to that she was a programmer and analyst at IBM and was later a project leader at CPC International and a project manager at Lever Brothers.

She received a B.S. in mathematics from the University of Arkansas. She is a member of the Association of Systems Management.

DONALD E. VARGO recently was appointed vice-president of information systems for the United Way of Tri-State in New York City. He is responsible for all data processing and word processing activities. Prior to this appointment he served as director of data processing.

Before joining the United Way, he was systems and programming manager for the Distribution Division of Pfizer, Inc.

•••

HANK LIPOWITZ has been named corporate manager of information systems for Computer Automation in Boulder, Colo.

Prior to joining the company, he was data processing manager at Johns-Manville Corp. Before that he was associated with General Electric Information Services Co.

Lipowitz earned a B.S. in business administration from Monmouth College.

•••

MAJORIE PARKE has been promoted to assistant treasurer in the Bank of New Jersey's Computer Services Department.

Parke held various programmer/analyst positions and worked for the International Computer Corp. before joining the Bank of New

Marjorie Parke

Jersey.

She is a graduate of the Programming and Systems Institute.

•••

MARVIN RICH has been named vice-president of data processing and communications for Western Airlines in Los Angeles.

Before joining the company, he was vice-president of management information systems for Jefferson Ward. Prior to that, Rich was with Carter Hawley Hale Stores, Inc., serving as vice-president of information systems and merchandise control.

He graduated from California State University at Fullerton, where he earned a B.A. degree in management and an MBA.

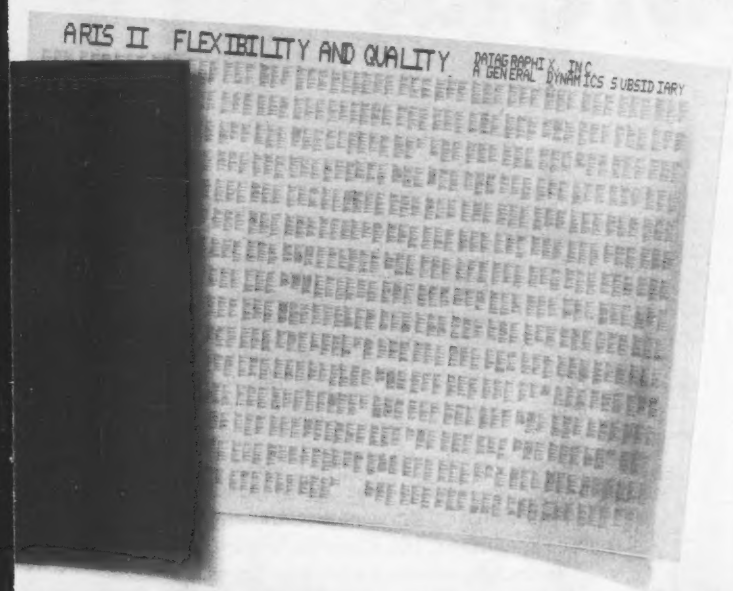
•••

JOHN ZAKRZEWSKI has been promoted to assistant vice-president for the Bank of New Jersey in Camden. In this new capacity he will continue to serve as systems and programming manager in the Bank's Computer Services Department.

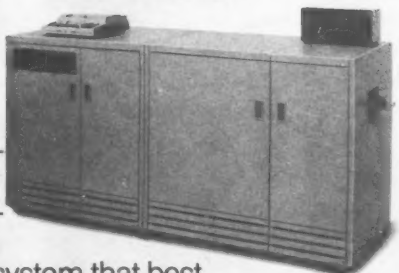
Prior to joining the bank, he was affiliated with N.W. Ayer, Inc. in Philadelphia.

Zakrzewski attended Temple University and Rutgers University.

John Zakrzewski



CLEAR-CUT ROI.



inexpensive to operate. In fact, we sell and service everything needed for total COM support. And now we've introduced ARIS II, a 12,000 LPM dry process recorder utilizing state-of-the-art laser imaging technology, multifont convenience, and the expertise of the people who invented COM.

At DatagraphiX, you can pick the system that best fits your company's needs, and end up with a tailor-made solution that will yield the quickest, highest ROI.

For more information, call or write to us at DatagraphiX. It's one of the wisest investments in time your company will ever make.

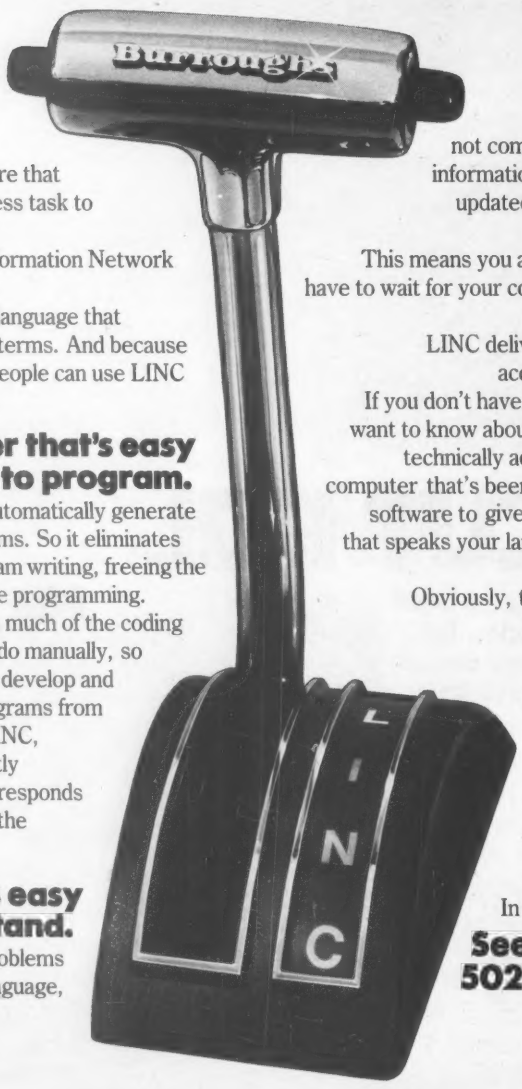
DatagraphiX, Inc. Dept. 3515, P.O. Box 82449, San Diego, CA 92138, (800) 854-2045, Ext. 5581. In California call (714) 291-9960. Ext. 5581 TWX (910) 335-2058.

DatagraphiX®

The Computer Output Management Company

a General Dynamics subsidiary.

At last, the automatic transmission comes to computers.



Burroughs introduces a new generation of computer software that can easily shift from one business task to another.

We call it LINC (Logic Information Network Compiler).

LINC is a new high-level language that responds to humans in human terms. And because it understands plain English, people can use LINC with very little training.

A computer that's easy to program.

LINC has the ability to automatically generate complete systems and programs. So it eliminates much of the drudgery of program writing, freeing the programmer for more creative programming.

LINC automatically does much of the coding a programmer would have to do manually, so it reduces the time it takes to develop and implement even complex programs from years to months. Plus with LINC, program maintenance is greatly reduced, too, because LINC responds at the specification level, not the language level.

A computer that's easy to understand.

With LINC, business problems can be defined in business language, not computer language, so important information can be easily extracted and updated. And new information easily created and managed.

This means you and your key people no longer have to wait for your computer to catch up with your work load.

LINC delivers information that's timely, accurate and in your own terms.

If you don't have a Burroughs computer, you'll want to know about The Business Partner. It's a technically advanced mid-range Burroughs computer that's been fitted with the exciting LINC software to give you a data processing system that speaks your language and is truly responsive to your business needs.

Obviously, there's more to LINC and The Business Partner than we can explain in this ad alone. So we're conducting a series of introductory seminars to fully explore what these amazing business tools can mean to you. It will pay you in more ways than you can imagine to attend. For reservations, call **1-800-521-4866.** In Michigan, **1-800-482-2402.**

See us at NCC Booth 5028.

Burroughs

Building on strength

Microdata Fastest in Order Entry

Wang, Burroughs Strong in Multiuser Tests

By Hillel Segal
Special to CW‡

The Wang Laboratories, Inc. 2200MVP and Burroughs Corp. B91 showed strong overall performances in multiuser benchmark tests, but other systems ran faster in individual tests. The Microdata Corp. 4000 had the fastest order entry benchmark when eight terminals were operating at once, with the Texas Instruments, Inc. DS990/4 coming in second.

Several of the systems did not have enough terminal or memory capacity to run the eight-terminal test simultaneously with the CPU-intensive test, a combination requiring nine terminals.

This group of a dozen systems was tested in the Association of Computer Users' (ACU) Series 3 Benchmark Reports, which cover multiuser systems in the $25,000 to $50,000 price range. Excerpted here are the results of just two tests; the full reports include runs with two, four, six and eight terminals as well as I/O-intensive tests.

In order to test response time when more than one terminal was in use at once, our benchmark team at the University of Colorado devised a remote terminal emulator (RTE) that connected to the computer under test. The order entry times shown here measure the average length of time the system took to respond to a 12-line input from the simulated terminals. To estimate the response time per line, the figures shown would be divided by 12. Our rule of thumb is that a response time per line of about .5 sec is acceptable to most users for simple business applications.

SCOREBOX

Summary of 12 Multiuser Systems Tested for the Association of Computer Users

SYSTEMS UP TO $50,000

System	Eight-Terminal Simultaneous Test (E-4) CPU-Intensive Task Time	Order Entry Response Time
Wang 2200MVP	16.4	4.6
IBM Series/1	(1)	(1)
Texas Instruments DS990/4	135.2	4.3
Hewlett Packard 250	(2)	(2)
DEC Datasystem 355	84.1	16.1
Alpha Micro AM-100T	45.2	5.7
Microdata 4000	239.7	3.4
Data General CS/50	112.4	9.8
Altos ACS8000-10	(3)	(3)
Burroughs B91	(4)	(4)
Ultimate A1	(5)	(5)
Datapoint 8600	57.4	5.2

Notes:
1. Simultaneous test was not performed due to testing difficulties.
2. Eight-terminal test not possible. Four-terminal test: CPU — 47.6, Order Entry 2.3.
3. Eight-terminal test not possible. Two-terminal test: CPU — 473.1, Order Entry — 6.8.
4. Tested using Burroughs' remote terminal emulator: CPU — 10.2, Order Entry — 3.2.
5. Eight-terminal test not possible. Six-terminal times: CPU — 135.2, Order Entry — 1.9.

A Look at the Systems

• Wang 2200MVP. The MVP set a quick pace for the group, giving impressive performances in several tests. A capable, well-designed system, it uses an advanced version of Basic called Basic-2. Software is offered both by Wang and outside vendors and is available in abundance. Users, however, felt that support from Wang was somewhat lacking.

• IBM Series/1. The Series/1 was fast on some problems and moderately fast on others. However, unresolved problems prevented the order entry test from running consistently. The Series/1 has a powerful operating system that offers versatility and modularity in both hardware and software. The operating system can be purchased or leased along with a choice of three languages. Price as tested was just above $50,000, but the system can be configured for less.

• Texas Instruments, Inc. DS990 Model 4. The Model 4 gave a mid-range benchmark performance, tested in Cobol. However, the CPU-intensive test ran much faster in Pascal or Fortran. Users reported being pleased with the system, and the benchmark team liked the DX10 operating system, which incorporates many user-friendly features. Applications software must be purchased from the dealer or OEM, as TI does not offer any.

• Hewlett-Packard Co. 250. The HP 250 performed well in a wide range of benchmark tests, although it is limited in the number of terminals that may be used. The benchmark team was especially impressed with the human engineering features, including softkeys, an adjustable CRT and menu-driven software that is not intimidating to the first-time user. Most users were very satisfied with the system, especially the software.

• Digital Equipment Corp. Datasystem 355. The 355 gave a generally mid-range performance, but began to slow down as terminals were added in the order entry test. A broad range of software is available for DEC systems and is compatible throughout the PDP-11 line of computers, which includes the 355. This model offers large storage capacity and an advanced operating system that allows dynamic memory partitioning and subroutine overlays. Users praised the equipment reliability and wide choice of peripherals.

• Alpha Microsystems, Inc. AM-100T. The Alpha Micro placed in the upper third of the group for speed. It has a powerful Amos operating system and Basic language, making the system easy to program and highly versatile. Pascal and Lisp languages are also provided. The system can be expanded to as many as 24 terminals, with 2,400M bytes of storage. Users reported few hardware problems and cited the systems software as a strong point. Compared with other systems with similar features, the Alpha Micro is inexpensive.

• Microdata Corp. 4000. While an excellent performer in the order entry test, the 4000 was slow on the CPU-intensive run. Its operating system is oriented to data base management and includes virtual memory. Users were unanimously pleased with the system, especially its ease of use, but there were some complaints about system speed.

This is the 55th in a series of articles giving the highlights of benchmark tests conducted on popular small computer systems. The full reports are available from the Association of Computer Users.

• Data General Corp. CS/50. Mid-range in some tests, the CS/50 was slower on others. It uses a semicompiled Cobol language that is transportable across the entire DG CS line of computers. A number of utilities, including a screenface generator and interactive program writer, make applications programming easier. The software is oriented to the OEMs, which generally write packages for end users.

• Altos Computer Systems, Inc. ACS8000-10. While this Altos model supports only four terminals, it has a capable Oasis operating system. Tests indicated that it runs about mid-range in order entry speed for a four-terminal configuration, but the system was slow in the CPU-intensive test. A wide variety of languages and software is available, and the system can also be used with MP/M or as a single-user CP/M system. While limited in expandability, it offers multiuser operation at a very low price.

• Burroughs B91. Because of differences in communications protocol, our remote terminal emulator could not be interfaced to the B91. Instead, an emulator devised by Burroughs was used for the multiuser tests. While the emulator's purpose is the same, the results cannot be compared directly with those of other systems.

However, the B91 did perform very well on all tests. The B91 has advanced communications capabilities and a four-chip processor with some "pipelining" in its operation, contributing to the system's speed. Burroughs offers an extensive line of software that is transportable across the Computer Management System (CMS) line. The majority of users contacted were pleased with both the system and Burroughs' support.

• Ultimate Corp. A1. While not supporting the nine terminals needed for the simultaneous test reported here, the Ultimate was fastest of the group on other order entry tests. Its CPU-intensive times were slower than most systems, however. Users were less than satisfied with service and support, but that should improve now that Honeywell, Inc. maintains nearly all items sold by Ultimate.

• Datapoint Corp. 8600. With mid-range benchmark performance, the 8600's outstanding feature is the Attached Resource Computer (ARC) local office network capability. The network allows modular growth and sharing of all system resources.

The configuration tested included two separate processors, so the simultaneous test times for CPU and order entry were the same as those obtained when the tests ran separately. The Databus language lacked structured programming statements and appears a weakness of the system. The only end-user software Datapoint supplies is a word processing package.

Obviously, simple runtime results should not be the sole criterion for purchasing a system. But all things being equal, users will favor the faster system, and there can be cases where slow performance will render a system unacceptable.

Undoubtedly the most important single feature of a system is the software available for it, and buyers are increasingly turning to packaged programs that will minimize the cost of special staff or contract labor.

In our next column, we will examine these issues in detail.

Segal is president of the Association of Computer Users, a nonprofit association with members in the U.S., Canada and several other foreign countries. A package of information about the Association of Computer Users is available from the group at P.O. Box 9003, Boulder, Colo. 80301.

Calendar

July 1-2, Chicago — **DP Physical Security.** Contact: Computer Security Institute, Educational Resource Center, P.O. Box 528, Matawan, N.J. 07747.

July 7-9, Chicago — **Data Processing: Fundamental Concepts.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 7-9, Toronto — **Data Communications: An Introduction to Concepts and Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 7-9, Minneapolis — **Network Communications Protocols.** Contact: Center for Advanced Professional Education, 11928 N. Earlham, Orange, Calif. 92669.

July 8-9, San Francisco — **Using CAD/CAM Systems: Planning, Equipment Selection and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 8-9, Boston — **Structured Documentation.** Contact: Carnegie Press Center for Documentation Resources, 100 Kings Road, Madison, N.J. 07940.

July 11-13, Andover, Mass. — **Digital Radiography.** Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

July 12-13, Washington, D.C. — **Computer Terminal Selection: Guidelines for Meeting Productivity Goals.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 12-14, Chicago — **Data Dictionary/Directory Systems: Evaluation and Selection.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 12-14, New York — **Systems Analysis and Design: Concepts and Effective Practice.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 12-14, New York — **Structured Testing: Tools and Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 12-14, New York — **DP Project Management: A Practical Approach.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 12-14, New York — **Planning for Office Automation: Concepts and Practices.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 12-14, New York — **Data Processing: Fundamental Concepts.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 12-14, San Francisco — **Data Communications: An Introduction to Concepts and Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 12-14, San Francisco — **Word Processing: Effective Operations Management.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 12-14, Chicago — **DP Operations Today: Effective Scheduling and Console Operation.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July, 12-14, Chicago — **Introduction to Word Processing: Concepts, Systems and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 12-14, Washington, D.C. — **Teleprocessing Software: An Introduction to Concepts, Systems and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 12-14, Washington, D.C. — **DP Network Architecture: Advanced Concepts.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 12-14, Washington, D.C. — **Advanced DP Management: Methods and Techniques in the '80s.** Contact: Seminar Department, Datapro Research Corp., Delran, N.J. 08075.

July 12-14, Dallas — **Data Base Management Systems: A Comparative Analysis of General Purpose Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 12-15, New York — **CICS/VS Logic & Debugging.** Contact: On-Line Software International, 65 Rt. 4 E., River Edge, N.J. 07661.

July 12-16, Houston — **CICS/VS Application Programming.** Contact: On-Line Software International, 65 Rt. 4 E., River Edge, N.J. 07661.

July 12-16, Santa Cruz, Calif. — **The Design and Implementation of Data Bases.** Contact: University of California Extension, Santa Cruz, Calif. 95064.

July 12-16, Santa Cruz, Calif — **Introduction to Computer Graphics.** Contact: University of California Extension, Santa Cruz, Calif. 95064.

July 14-15, Cary, N.C. — **SAS Color Graphics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Now the world's best selling printers are being serviced by the world's most trusted service company. Epson America, Inc., has linked up with RCA to bring Epson users the ultimate in service reliability.

From now on, you can count on professional service from over 400 RCA specialists working out of 180 service locations nationwide. And RCA offers a variety of service arrangements.

RCA will honor your Epson warranty and also extend this warranty service protection. Service will be provided either at your location or at one of RCA's six repair centers. We're as close as your telephone. Just call the RCA office nearest you . . . or fill out and mail the coupon.

RCA Service Company
A Division of RCA
Data Services, Bldg. 204-2
Route #38, Cherry Hill, N.J.
08358

Contact me immediately about service coverage on my Epson printers.

F-193

Name _____
Title _____
Firm _____
Address _____
City _____
State _____ Zip _____
Telephone _____

RCA Data Services A tradition on the move.

800-962-2836 — Northern New Jersey • 800-631-8823 — New Hampshire, Massachusetts, Vermont, New York, Connecticut, Rhode Island • 800-322-5571 — Southern New Jersey • 800-257-8118 — Pennsylvania (Eastern Half), Maryland, Delaware, Washington, D.C. • 800-257-8138 — Virginia, West Virginia, Western Pennsylvania, Ohio • 800-282-9147 — Georgia • 800-241-9150 — North Carolina, South Carolina, Tennessee, Alabama, Virginia (S.W. Corner), Florida, Mississippi, Kentucky • 800-792-2974 — Texas • 800-433-2462 — Kansas, Arkansas, Oklahoma, Louisiana, Missouri (Western 2/3) • 800-433-8820 — Colorado, New Mexico, Wyoming (S.E. 1/4) • 800-942-2556 — Illinois • 800-323-1019 — Iowa, Indiana, Michigan, Minnesota, Missouri (Eastern 1/3), Ohio, Wisconsin • 800-323-1036 — Nebraska, North Dakota, South Dakota • 800-372-6444 — California • 800-423-4350 — Washington, Oregon, Idaho, Utah, Arizona, Montana, Nevada, Wyoming.

Reduces Forms Load

Edmonton System Sparks Interest From Others

EDMONTON, Alta. — A software program designed for centralized inventory control by the city of Edmonton has sparked interest from other municipal governments.

The software was developed to manage the inventory investment of various city departments, according to one city spokesman. The project grew out of a study performed by the city in the mid-1970s, and the design of the system started in 1978, he said.

Since becoming operational last November, the Common Inventory System (Coins) has had several notable results, according to officials involved in the project. Specifically, Coins has reduced from 34 to four the number of forms necessary to document a single stock transaction and has provided immediate access through computer terminals of quantity, cost and location of any item in stock at any of the city's 21 warehouses with inventory valued at $110 million this year.

Several subsystems, including common stock numbering, are expected to be incorporated into the system later this year.

"It's difficult to put a dollar value on the savings since many of the spin-offs are still being developed," according to Marv Thompson, systems development manager for Edmonton's Computer Systems Development and Services Department. "But we do know inventory levels have dropped," he said.

Edmonton's population growth has been dramatic, with the population rising to 600,000 from about 400,000 five years ago. While no one has been displaced from a job because of the system, the city expects to hire less additional staff in the future, according to Donald S. Ausman, general manager of the Computer Systems Development and Services Department.

Umbrella of Systems

Coins is just one of a number of programs being developed under the umbrella of corporate information systems, a blueprint for automating the city, Thompson explained.

"For example, we are moving into the second phase of automated purchasing. Phase one involved using word processing to generate purchase orders," he said. An accounts payable system is now being enhanced and is scheduled to become operational by the middle of the year.

A key feature of the updated payables system is a match facility. This allows a three-way computerized match between invoice, receiving report and purchase order. Thompson said that he is not aware of any other system that allows three-part matching.

One of the fortunate offshoots of the project has been stimulating the interest of other municipal governments to purchase Coins, most notably the city of Montreal. "We met the Montreal people through the USE [Univac Scientific Exchange] organization, a group of large-scale Sperry Univac users that meets twice a year," Thompson said.

Large Computer User

Edmonton is one of the largest computer users for a city of its size, Thompson claimed. Currently, the city utilizes three Univac systems — a 1100/82 for production work, a 1100/62 for test development and a 1100/61 for research and applications, developed under the firm's Mapper management information system. The city also uses about 700 Univac terminals.

"Our production volume has reached a total of three million transactions per month," Thompson said.

Because of the compatibility of the computers used in Edmonton and Montreal, Thompson said that getting the software fully up and running in Montreal will take about six months, which is considered to be a relatively short time.

Noting that a number of cities are interested in acquiring the Coins system, Thompson remarked that licensing the technology gives Edmonton a chance to recoup part of the cost spent on developing the system. However, he added that the city is not very interested in getting into marketing computer programs on a major scale.

CAM-I Proceedings Available to Public

ARLINGTON, Texas — The proceedings from Computer-Aided Manufacturing-International, Inc.'s (CAM-I) Computer-Aided Quality conference held recently in Baltimore are available to the public.

Topics covered at the conference include: test and measurement, inspection/information and quality standards for software development, among others.

The illustrated 320-page document costs $49. Orders should ask for the proceedings, Document No. P-82-MMX-01 and be directed to the Library Coordinator, CAM-I, Suite 1107, 611 Ryan Plaza Drive, Arlington, Texas 76012.

CONVERTING TO OS?

EASY MADE EASIER.

Now you can run OS without converting DOS programs or JCL. With new UCC-2 + 20.

It used to be that conversion from DOS to OS took three steps: a lot of careful planning, a laborious translation of all JCL, plus a massive (and expensive) conversion of thousands of programs.

The UCC-2 DOS under OS System changed all that — eliminating the need to convert any DOS programs to OS. That makes converting to OS easy.

Now, the UCC-20 JCL Generator makes it easier. And it won't generate JCL that doesn't fit your own predefined standards.

So, with UCC-2 + 20, once you've completed the planning and preparation phase — you're running OS. It's that simple.

With UCC-2, getting to OS was easy. Now, with UCC-2 + 20, it's even easier.

For more information, call us toll-free at 1-800-527-5012 (in Texas, 214-353-7312).

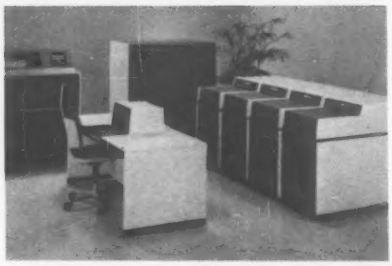
UCC

... has done it again!

UNIVERSITY COMPUTING COMPANY • DALLAS • LONDON • TORONTO • ZURICH

New!

The NCR V-8500 II computer series for even better price/performance.



More systems, larger memories than ever — for faster transaction processing.

The new V-8500-II Series now offers an even wider range of systems. Seven models, including a new, smaller, entry-level system and two new, larger computers, all provide virtual operation, increased memory and expanded performance.

Sharply increased price/performance — This new series now offers more power per dollar invested. More than 40 percent better than NCR's already highly competitive price/performance levels.

Lower entry level — The new V-8535-II is a 32-bit processor with cycle time of 112 nanoseconds and a memory of one megabyte. It employs NCR's powerful Virtual Resource Executive (VRX) operating software.

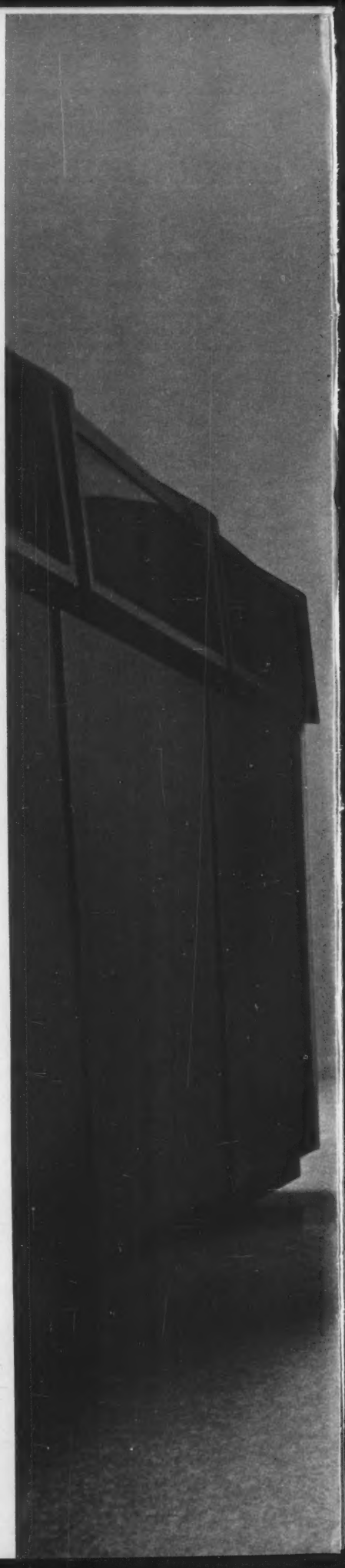
Expanded memory — For most of the enhanced systems in the new series, potential memory is increased from 50 to 100 percent. Maximum memory now ranges from one megabyte for the V-8535-II to eight megabytes for the dyadic V-8595-II.

New dyadic systems — The NCR V-8500-II Series now includes three dyadic systems. Systems that combine symmetrical, tightly-coupled dual processors in a single cabinet. Both processors share all system resources equally with continuous dynamic load leveling.

Migration Path Engineering — As always, NCR provides easy transition from one system to the next without difficult conversion of software.

For more information, just call toll free (800) 543-8130 (in Ohio, 800-762-6517). Or write to EDP Systems, NCR Corporation, Box 606, Dayton, Ohio 45401.

NCR
98 Years Experience in Business Systems



Recession, Familiarity Cited

Mini Users Stay with Present Units — Survey

By Tim Scannell
CW Staff

DELRAN, N.J. — Blame it on the recession or a simple fondness for the familiar, but most minicomputer and small business systems users will be keeping their computers this year, according to a survey conducted by Datapro Research Corp.

However, a number of users will opt for a change and switch computers, the majority staying with the same vendor.

About 150 of the 1,172 IBM systems users polled revealed plans to upgrade their computers by purchasing or leasing new processors from IBM. More than half of those anticipating changes are users of IBM's System/34 minicomputer. The rest are made up of a large number of IBM System/3 users — 65 of the 211 people polled — as well as owners of the firm's Model 1130, System/32 and System/38 machines.

None of the 45 IBM Series/1 computer users reported plans to switch systems. In addition, less than 2% of the total IBM systems users polled wanted to switch both machines and vendors, the survey detailed.

Nearly 22% of the 231 Burroughs Corp. system users in the study set aside 1982 as the year for systems changes, with one-fifth looking toward other vendor fields. Burroughs B800 and B1800 users topped the list of that firm's customers who want to change processors this year, the survey noted. More than 26% of the 118 users in this category expressed a desire for a swap, most of them staying with the same vendor.

About 12.6% of the 332 Digital Equipment Corp. systems users queried will change computers sometime this year, the Datapro study claimed. About 18 DEC PDP-11/34 and 11/44 users and 14 PDP-11/74 users detailed plans to upgrade their systems. Only one 32-bit VAX computer user, out of 54 in the survey, reported a systems swap on the horizon.

Besides expanding present hardware, most users in the Datapro study will buy additional software — almost an equal amount from the vendor and from third-party suppliers, the survey said. Other major implementation plans include expansions to data communications and a beefing up of distributed processing capabilities.

Users Report No Shortage of Problems

(Continued from Page 1)

• Burroughs Corp. systems users, the third-largest group in the survey, voted the firm in ninth among the more than 21 vendors in the Datapro lineup. Burroughs barely squeezed ahead of Qantel Corp., NCR Corp. and Honeywell, Inc. by a few hundreths of a point. Those three firms finished tenth, eleventh and twelfth, respectively, the survey noted.

• Minicomputers from General Automation, Inc. (GA) placed last in the survey, marking the third year in a row the Calif.-based firm has ended up at the end of the user ratings score sheet. A total of 11 GA users participated in this year's survey, representing 12 computer systems.

A number of users in the survey — for one reason or another — refused to recommend their brand of systems to other users.

Nearly half the 11 GA systems users and 40% of the 16 Harris Corp. computer users in the survey would not advocate using their computers to other people. A little more than 6% of the IBM and DEC users polled — or about 73 and 20 people, respectively — would not recommend their systems to potential computer buyers. About 11% of the Data General Corp. computer users and more than 9% of the Burroughs minicomputer users also declined to give their stamps of approval for future users.

No Shortage of Problems

As in past years' surveys, this year's had no shortage of users reporting minor and sometimes major problems with their systems. Nearly one-fifth of the 2,753 users polled in the survey complained the vendors did not supply all the promised software or support. For instance, about 11% of the 332 DEC system users and 19% of DG's users reported their respective vendors are lacking in these areas. Last-place winner GA has a major problem in this area, with more than half the surveyed users citing the firm for missing software and support, the study showed.

The next major problem area concerned vendor enhancements to existing systems. About 12.5% of the users queried by Datapro reported that it is difficult to keep up with the vendors' changes to hardware and software. Perkin-Elmer Corp. systems users garnered the largest number of negative responses in this area, with more than 58% of the 24 polled citing problems, the survey showed.

A significant number of users questioned also reported late deliveries of both hardware and equipment. Nearly 28% of the more than 200 Burroughs users in the survey reported the vendor missed the initial installation date. In addition, about 15.5% of those users claimed software was also among the missing when the promised delivery dates arrived.

As in past years, technical support generated across-the-board lukewarm responses from the users in the survey. On a scale from 1 to 4 (with 4 being the highest rating), documentation received an average rating of 2.4 — making it the one of the most troubled spots. It is followed closely by education and vendor troubleshooting, the survey found.

Survey Gets 35% Response

DELRAN, N.J. — The results of Datapro Research Corp.'s 1982 user survey of computer systems are based on returns from a mailing of 15,033 questionnaires sent to a cross-section of *Computerworld* readers. Users were asked to rate their mainframes, minicomputers and small business systems in 14 categories.

Datapro received 5,330 completed questionnaires from 5,029 respondents, representing a 35% response rate. Of those, Datapro judged 246 responses invalid, giving a total of 5,084 valid responses from 4,783 users with a total of 6,147 installed mainframes, minicomputers and small business systems.

Complete details of the survey are compiled in a 39-page report, "1982 User Ratings of Computer Systems," available for $25 a copy from Datapro, 1805 Underwood Ave., Delran, N.J. 08075.

NEW

VIDEO TRAINING
FOR
IDMS-1982

Another Industry First From ASI

Through an exclusive agreement with Mr. Thomas Meurer, President of ETA-Eastern Technical Associates, **ASI** now offers the most comprehensive video training program on Cullinane Software Products **available today.**

The IDMS training series will teach data processing personnel all of the skills necessary to properly apply and fully utilize the vast facilities of:

+ IDMS-DB	20 Modules
+ IDD	12 Modules
+ IDMS-DC/UCF	17 Modules
+ CULPRIT	10 Modules
+ EDP AUDITOR	12 Modules

COMPLETE CURRICULUM

These extensive videotape series are current with the latest release levels and provide over 100 hours of **practical, in-depth, skills-building** training.

This series combines the IDMS-1982 expertise of Thomas Meurer, a nationally known data base lecturer with the cost effective benefits of the **ASI Multi-Media Library.**

+ PROVEN SKILLS TRANSFER
+ REDUCED TRAINING TIME
+ ON-SITE AVAILABILITY
+ MODULAR DESIGN

COST EFFECTIVE TRAINING

ASI
THE TOTAL TRAINING RESOURCE

Advanced Systems, Incorporated
2340 S. Arlington Heights. Rd.
Arlington Heights, IL 60005

ATLANTA 404/955-2732 • BOSTON 617/237-4802 • CALGARY 403/244-6837 • CHICAGO 312/649-1666 • CINCINNATI 513/769-0815 • CLEVELAND 216/464-5810 • CONNECTICUT 203/227-1799 • DALLAS 214/233-0235 • DENVER 303/779-6747 • DETROIT 313/552-1141 • HOUSTON 713/965-0171 • INDIANAPOLIS 317/875-5590 • KANSAS CITY 913/262-3383 • LANSING 517/321-4445 • LOS ANGELES 213/450-1611 • MIAMI 305/621-7292 • MILWAUKEE 414/784-3533 • MINNEAPOLIS 612/854-2276 • NEW JERSEY 201/560-1610 • NEW YORK 212/697-3110 • PHILADELPHIA 215/687-3369 • PHOENIX 602/831-0963 • PITTSBURGH 412/279-1580 • SAN FRANCISCO 415/873-8040 • ST. LOUIS 314/569-0854 • SEATTLE 206/447-9498 •TORONTO 416/977-0762 (312/583-3470) • TULSA 918/663-7927 • WASHINGTON 703/524-2277

Survey Item / Manufacturer and Model	Basic Four All models	Burroughs B 700 & B 1700	Burroughs B 80	Burroughs B 800 & B 1800	Burroughs B 90	Burroughs B 900	Burroughs B 1900	Data General NOVA 3	Data General NOVA 4
No. of User Responses	44	20	7	118	7	6	77	20	13
No. of Systems Represented	47	21	15	125	15	6	80	37	17
Avg. Life of System (Mos.)	36.5	57.3	42.8	31.5	19.1	11.7	11.6	47.5	20.3
Acquisition Method (%)									
Purchase	81.82	75.00	83.33	57.89	71.43	50.00	51.95	85.00	84.62
Rental or Lease from Mfr.	0.00	10.00	16.67	36.84	14.29	50.00	46.75	0.00	7.69
Lease from 3rd Party	18.18	15.00	0.00	5.26	14.29	0.00	1.30	15.00	7.69
Principal Applications (%)									
Accounting/Billing	88.64	65.00	71.43	82.46	71.43	100.00	79.22	75.00	69.23
Banking—check processing/loans/savings	2.27	15.00	14.29	10.53	14.29	0.00	10.39	0.00	7.69
Construction/Architecture	9.09	0.00	0.00	5.26	0.00	0.00	2.60	5.00	0.00
Education—scheduling/administration	6.82	5.00	0.00	9.65	0.00	0.00	10.39	0.00	15.38
Engineering/Scientific	0.00	10.00	0.00	6.14	0.00	0.00	1.30	15.00	0.00
Health care/Medical	9.09	0.00	14.29	6.14	0.00	0.00	5.19	5.00	0.00
Insurance	6.82	0.00	0.00	4.39	0.00	0.00	5.19	0.00	0.00
Manufacturing	22.73	15.00	0.00	20.18	0.00	66.67	23.38	20.00	15.38
Mathematics/Statistics	2.27	5.00	0.00	4.39	0.00	0.00	3.90	20.00	15.38
Order Processing/Inventory Control	65.91	45.00	42.86	55.26	42.86	83.33	55.84	65.00	30.77
Payroll/Personnel	63.64	45.00	28.57	68.42	28.57	100.00	66.23	30.00	23.08
Petroleum/Fuel analysis	2.27	10.00	0.00	4.39	0.00	0.00	0.00	0.00	0.00
Process control	6.82	10.00	0.00	0.88	0.00	0.00	1.30	10.00	0.00
Purchasing	43.18	35.00	0.00	27.19	0.00	50.00	27.27	35.00	0.00
Sales Distribution	63.64	35.00	14.29	30.70	14.29	66.67	35.06	45.00	23.08
Other	31.82	20.00	28.57	12.28	28.57	16.67	20.78	20.00	23.08
Source of Applications Programs (%)									
In-house personnel	75.00	75.00	42.86	90.35	71.43	83.33	81.82	60.00	38.46
"Packaged" programs from manufacturer	36.36	50.00	57.14	34.21	57.14	66.67	40.26	10.00	7.69
Contract Programming	47.73	35.00	48.86	32.46	14.29	16.67	23.38	50.00	30.77
Manufacturer's Personnel	0.00	5.00	0.00	0.88	0.00	16.67	1.30	0.00	0.00
Proprietary Software Packages	43.18	10.00	14.29	29.82	0.00	0.00	24.68	40.00	46.15
Location of Computer (%)									
Distributed Processing Site	11.36	5.00	16.67	5.31	0.00	0.00	9.09	0.00	23.08
Central Processing Installation	88.64	95.00	83.33	94.69	100.00	100.00	90.91	100.00	76.92
Using Local Workstations/Terminals (%)	100.00	70.00	57.14	98.25	100.00	100.00	100.00	45.00	38.46
Using Remote Workstations/Terminals (%)	58.14	30.00	0.00	60.36	0.00	20.00	53.95	40.00	66.67
Using Data Base Management System (%)	15.91	40.00	28.57	52.63	71.43	16.67	64.94	20.00	23.08
None	84.09	60.00	71.43	47.37	28.57	83.33	35.06	80.00	76.92
Manufacturer's Package	14.29	62.50	0.00	86.67	60.00	0.00	91.84	0.00	0.00
Outside Vendor's Package	71.43	12.50	50.00	6.67	0.00	0.00	4.08	50.00	100.00
Home-Grown System	14.29	25.00	50.00	6.67	40.00	0.00	4.00	50.00	0.00
Using Communications Monitor (%)	13.64	20.00	28.57	66.67	85.71	33.33	61.04	15.00	30.77
None	86.36	80.00	71.43	33.33	14.29	66.67	38.96	85.00	69.23
Manufacturer's Package	60.00	100.00	50.00	93.06	100.00	100.00	91.30	66.67	0.00
Outside Vendor's Package	20.00	0.00	50.00	4.17	0.00	0.00	2.17	0.00	50.00
Home-Grown System	20.00	0.00	0.00	2.78	0.00	0.00	6.52	33.33	50.00
Using Integrated Word Processing Functions (%)	22.73	0.00	14.29	5.41	0.00	0.00	10.53	15.00	15.38
Planned Acquisitions/Implementations for 1982 (%)									
Additional Software from the Manufacturer	2.27	15.00	14.29	15.79	28.57	33.33	19.48	5.00	15.38
Proprietary Software from other suppliers	15.91	15.00	14.29	23.68	42.86	16.67	28.57	30.00	30.77
Expansions to Data Communications facilities	40.91	10.00	0.00	43.86	28.57	33.33	37.66	10.00	7.69
Distributed Processing capabilities	15.91	0.00	0.00	11.40	28.57	33.33	16.88	5.00	0.00
Expansions to present hardware	54.55	20.00	0.00	41.23	14.29	50.00	35.06	35.00	30.77
Another Computer System, same model	6.82	5.00	14.29	3.51	0.00	16.67	5.19	5.00	7.69
Business graphics	6.82	0.00	0.00	1.75	0.00	0.00	2.60	0.00	7.69
Plans for system replacement in 1982 (%)									
Yes, same manufacturer	6.82	35.00	0.00	21.05	14.29	0.00	3.90	15.00	0.00
Yes, vendor unknown	2.27	10.00	0.00	2.63	0.00	0.00	0.00	10.00	7.69
Yes, different vendor	9.09	15.00	14.29	2.63	0.00	16.67	2.60	5.00	7.69
No	81.82	35.00	71.43	73.68	85.71	83.33	93.51	70.00	84.62

Survey Item / Manufacturer and Model	Basic Four All models	Burroughs B 700 & B 1700	Burroughs B 80	Burroughs B 800 & B 1800	Burroughs B 90	Burroughs B 900	Burroughs B 1900	Data General NOVA 3	Data General NOVA 4
Significant Advantages (%)									
Users are happy with response time	56.82	40.00	14.29	62.28	42.86	66.67	55.84	45.00	46.15
System is easy to expand/reconfigure	61.36	55.00	14.29	71.93	71.43	83.33	74.03	40.00	46.15
System costs were less than expected	9.09	10.00	14.29	15.79	28.57	16.67	22.08	5.00	15.38
Programs/data carried over from other systems are compatible, as vendor promised	29.55	35.00	14.29	50.00	57.14	100.00	58.44	15.00	23.08
Terminals/peripherals carried over from other systems are compatible, as vendor promised	22.73	20.00	0.00	28.95	28.57	83.33	38.96	5.00	23.08
System is power/energy efficient	22.73	20.00	14.29	15.79	42.86	33.33	27.27	5.00	7.69
Productivity aids help us keep programming costs down	29.55	15.00	0.00	35.09	14.29	66.67	49.35	5.00	15.38
Data base language is efficient and effective	18.18	20.00	14.29	40.35	28.57	16.67	42.86	10.00	7.69
Delivery and/or installation of equipment was ahead of schedule	13.64	5.00	0.00	13.16	0.00	33.33	20.78	15.00	15.38
Delivery of required software was ahead of schedule	2.27	5.00	0.00	11.40	0.00	16.67	16.88	5.00	15.38
Significant Problems (%)									
Computer proposed by vendor was too small	11.36	10.00	42.86	8.77	0.00	0.00	5.19	25.00	15.38
Installation of equipment was late	13.64	0.00	42.86	28.95	28.57	33.33	31.17	15.00	7.69
Delivery of required software was late	13.64	5.00	28.57	14.91	28.57	33.33	15.58	35.00	15.38
System costs (for hardware, vendor-supplied software, support) exceeded the expected total	27.27	0.00	28.57	1.75	0.00	0.00	9.09	30.00	0.00
Vendor did not provide all the promised software or support	25.00	20.00	42.86	15.79	28.57	0.00	20.78	30.00	15.38
Program/data compatibility not what vendor promised	4.55	10.00	14.29	3.51	0.00	0.00	6.49	5.00	0.00
Terminals/peripherals compatibility not what vendor promised	4.55	5.00	14.29	3.51	0.00	0.00	2.60	5.00	0.00
Vendor enhancements/changes to hardware/software hard to keep up with	15.91	10.00	28.57	15.79	28.57	0.00	5.19	5.00	0.00
Equipment is excessively noisy	11.36	0.00	14.29	4.39	0.00	0.00	3.90	5.00	0.00
Power and/or cooling requirements are excessive	2.27	5.00	28.57	7.02	14.29	0.00	3.90	0.00	7.69
System Ratings (4.0-1.0)									
Ease of operation	3.73	3.60	2.57	3.62	3.14	4.00	3.73	3.16	3.31
Reliability of Mainframe	3.40	3.35	2.86	3.52	3.86	3.83	3.37	3.40	3.31
Reliability of Peripherals	3.23	2.90	2.67	2.90	3.33	3.17	2.93	3.05	3.00
Maintenance service:									
Responsiveness	3.27	2.75	2.71	2.85	3.43	3.17	3.09	3.11	3.00
Effectiveness	3.05	2.50	2.50	2.65	3.17	3.50	2.84	3.11	3.08
Technical support:									
Trouble-shooting	2.65	2.42	2.29	2.48	2.43	2.50	2.52	2.63	2.92
Education	2.26	2.50	2.00	2.56	2.29	2.67	2.45	2.35	2.50
Documentation	1.95	2.50	2.00	2.14	2.17	2.67	1.97	2.35	2.46
Manufacturer's software:									
Operating system	3.14	3.84	2.86	3.72	3.57	4.00	3.61	2.76	3.17
Compilers & Assemblers	3.09	3.63	2.71	3.40	3.14	3.83	3.39	2.86	3.00
Applications Programs	2.68	2.69	2.20	2.56	2.40	2.80	2.55	2.80	3.00
Ease of Programming	3.55	3.22	2.71	3.34	3.43	3.83	3.43	2.76	3.08
Ease of conversion	2.91	3.18	2.60	3.23	3.40	3.83	3.33	2.27	2.78
Overall satisfaction	3.07	3.00	2.43	3.20	3.14	3.67	3.23	2.95	2.92
Did the system do what you expected it to do? (%)									
Yes	93.18	95.00	42.86	92.98	85.71	100.00	83.12	90.00	76.92
No	0.00	5.00	57.14	7.02	14.29	0.00	3.90	10.00	7.69
Haven't decided	6.82	0.00	0.00	0.00	0.00	0.00	12.99	0.00	15.38
Would you recommend system to another user? (%)									
Yes	72.73	57.89	57.14	84.07	71.43	100.00	81.82	88.89	69.23
No	20.45	42.11	14.29	7.96	14.29	0.00	2.60	11.11	15.38
Haven't decided	6.82	0.00	28.57	7.96	14.29	0.00	15.58	0.00	15.38

© 1982 Datapro Research Corporation, Delran, N.J. 08075 USA

Users Rate Their Minis . . .

. . . And Their Manufacturers : . .

Survey Item	Data General Eclipse	Datapoint ARC	Digital Equipment PDP-8	Digital Equipment PDP-11	Digital Equipment 1103 & 1123	Digital Equipment 1134 & 1144	Digital Equipment 1170	Digital Equipment VAX	Four Phase All models
No. of User Responses	98	66	8	15	20	109	126	54	51
No. of Systems Represented	138	129	17	22	28	129	190	80	75
Avg. Life of System (Mos.)	29.5	31.8	58.4	57.1	22.8	32.2	34.3	17.2	27.0
Acquisition Method (%)									
Purchase	79.59	57.58	62.50	86.67	80.00	83.49	79.84	77.78	9.80
Rental or Lease from Mfr.	2.04	36.36	0.00	0.00	0.00	5.50	4.03	3.70	72.55
Lease from 3rd Party	18.37	6.06	37.50	13.33	20.00	11.01	16.13	18.52	17.65
Principal Applications (%)									
Accounting/Billing	69.39	87.88	75.00	60.00	40.00	65.14	65.08	40.74	56.86
Banking—check processing/loans/savings	9.18	6.06	0.00	6.67	10.00	3.67	8.73	3.70	1.96
Construction/Architecture	3.06	1.52	12.50	20.00	0.00	2.75	2.38	7.41	0.00
Education—scheduling/administration	10.20	6.06	12.50	33.33	15.00	16.51	18.25	7.41	3.92
Engineering/Scientific	12.24	4.55	37.50	26.67	30.00	12.84	15.08	51.85	1.96
Health care/Medical	7.14	1.52	0.00	0.00	0.00	9.17	5.56	3.70	33.33
Insurance	8.16	4.55	0.00	0.00	0.00	1.83	2.38	0.00	7.84
Manufacturing	18.37	15.15	12.50	6.67	15.00	10.09	15.08	14.81	23.53
Mathematics/Statistics	12.24	4.55	12.50	6.67	10.00	12.84	14.29	37.04	3.92
Order Processing/Inventory Control	46.94	54.55	25.00	26.67	30.00	38.53	39.68	22.22	50.98
Payroll/Personnel	42.86	39.39	62.50	46.67	30.00	44.95	46.83	27.78	47.06
Petroleum/Fuel analysis	6.12	1.52	12.50	0.00	0.00	2.75	3.17	0.00	1.96
Process control	3.06	1.52	12.50	0.00	10.00	3.67	0.79	11.11	1.96
Purchasing	21.43	19.70	25.00	13.33	20.00	15.60	19.84	11.11	23.53
Sales Distribution	30.61	33.33	25.00	13.33	30.00	19.27	22.22	20.37	23.53
Other	23.47	34.85	37.50	33.33	30.00	29.36	29.37	25.93	25.49
Source of Applications Programs (%)									
In-house personnel	85.71	81.82	87.50	66.67	65.00	78.90	78.57	79.63	66.67
"Packaged" programs from manufacturer	18.37	27.27	37.50	33.33	20.00	29.36	23.81	44.44	33.33
Contract Programming	34.69	34.85	50.00	33.33	20.00	36.70	25.40	20.37	23.53
Manufacturer's Personnel	1.02	3.03	12.50	0.00	0.00	4.59	3.17	9.26	5.88
Proprietary Software Packages	45.92	24.24	37.50	40.00	50.00	37.61	49.21	44.44	29.41
Location of Computer (%)									
Distributed Processing Site	12.24	21.21	0.00	20.00	30.00	13.76	8.73	33.33	37.25
Central Processing Installation	87.76	78.79	100.00	80.00	70.00	86.24	91.27	66.67	62.75
Using Local Workstations/Terminals (%)	100.00	96.92	87.50	100.00	100.00	100.00	100.00	100.00	100.00
Using Remote Workstations/Terminals (%)	60.82	54.69	37.50	73.33	33.33	59.81	83.06	79.63	30.43
Using Data Base Management System (%)	32.65	10.61	12.50	33.33	40.00	35.78	38.89	44.44	19.61
None	67.35	89.39	87.50	66.67	60.00	64.22	61.11	55.56	80.39
Manufacturer's Package	84.38	28.57	0.00	0.00	12.50	33.33	16.33	37.50	40.00
Outside Vendor's Package	3.13	28.57	100.00	60.00	50.00	48.72	61.22	33.33	50.00
Home-Grown System	12.50	42.86	0.00	40.00	37.50	17.95	22.45	29.17	10.00
Using Communications Monitor (%)	24.49	45.31	25.00	26.67	20.00	22.02	26.19	25.93	47.06
None	75.51	54.69	75.00	73.33	80.00	77.98	73.81	74.07	52.94
Manufacturer's Package	65.22	92.86	0.00	0.00	0.00	75.00	66.67	71.43	73.91
Outside Vendor's Package	21.74	3.57	0.00	75.00	75.00	16.67	26.67	14.29	21.74
Home-Grown System	13.04	3.57	100.00	25.00	25.00	8.33	16.67	14.29	4.35
Using Integrated Word Processing Functions (%)	23.47	47.69	37.50	33.33	50.00	29.63	37.30	45.28	52.94
Planned Acquisitions/Implementations for 1982 (%)									
Additional Software from the Manufacturer	25.51	34.85	12.50	20.00	15.00	20.18	15.08	40.74	35.29
Proprietary Software from other suppliers	29.59	33.33	37.50	20.00	55.00	30.28	52.38	51.85	11.76
Expansions to Data Communications facilities	39.80	27.27	25.00	6.67	15.00	24.77	30.95	40.74	13.73
Distributed Processing capabilities	15.31	13.64	25.00	6.67	10.00	13.76	13.49	9.26	15.69
Expansions to present hardware	51.02	51.52	25.00	33.33	60.00	46.79	41.27	55.56	45.10
Another Computer System, same model	12.24	9.09	12.50	0.00	15.00	7.34	10.32	22.22	9.80
Business graphics	10.20	4.55	12.50	0.00	0.00	11.01	10.32	20.37	9.80
Plans for system replacement in 1982 (%)									
Yes, same manufacturer	4.08	6.06	12.50	26.67	10.00	12.84	7.94	1.85	17.65
Yes, vendor unknown	4.08	1.52	0.00	0.00	0.00	1.83	2.38	0.00	3.92
Yes, different vendor	7.14	6.06	0.00	13.33	0.00	1.83	0.79	0.00	9.80
No	83.67	86.36	87.50	53.33	90.00	81.65	88.89	98.15	68.63

Survey Item	Data General Eclipse	Datapoint ARC	Digital Equipment PDP-8	Digital Equipment PDP-11	Digital Equipment 1103 & 1123	Digital Equipment 1134 & 1144	Digital Equipment 1170	Digital Equipment VAX	Four Phase All models
Significant Advantages (%)									
Users are happy with response time	46.94	40.91	62.50	33.33	40.00	58.72	69.05	79.63	50.98
System is easy to expand/reconfigure	58.16	81.82	62.50	40.00	65.00	60.55	73.02	81.48	47.06
System costs were less than expected	10.20	18.18	25.00	0.00	10.00	10.09	16.67	18.52	11.76
Programs/data carried over from other systems are compatible, as vendor promised	18.37	45.45	0.00	6.67	35.00	22.02	26.19	40.74	11.76
Terminals/peripherals carried over from other systems are compatible, as vendor promised	15.31	34.85	0.00	6.67	45.00	25.69	27.78	42.59	9.80
System is power/energy efficient	11.22	25.76	12.50	0.00	20.00	13.76	15.08	12.96	17.65
Productivity aids help us keep programming costs down	24.49	18.18	12.50	0.00	10.00	19.27	34.13	46.30	23.53
Data base language is efficient and effective	13.27	9.09	12.50	26.67	10.00	17.43	19.05	14.81	11.76
Delivery and/or installation of equipment was ahead of schedule	12.24	13.64	12.50	0.00	5.00	10.09	11.90	20.37	11.76
Delivery of required software was ahead of schedule	9.18	7.58	12.50	6.67	0.00	5.50	7.94	9.26	5.88
Significant Problems (%)									
Computer proposed by vendor was too small	11.22	13.64	12.50	6.67	0.00	11.93	4.76	3.70	13.73
Installation of equipment was late	15.31	10.61	0.00	20.00	20.00	12.84	8.73	18.52	29.41
Delivery of required software was late	13.27	13.64	12.50	20.00	20.00	10.09	7.94	9.26	15.69
System costs (for hardware, vendor-supplied software, support) exceeded the expected total	13.27	3.03	0.00	13.33	0.00	10.09	6.35	1.85	7.84
Vendor did not provide all the promised software or support	17.35	12.12	0.00	26.67	5.00	18.35	7.94	3.70	31.37
Program/data compatibility not what vendor promised	10.20	3.03	12.50	0.00	0.00	1.83	2.38	0.00	11.76
Terminals/peripherals compatibility not what vendor promised	2.04	3.03	0.00	0.00	0.00	0.92	0.00	3.70	3.92
Vendor enhancements/changes to hardware/software hard to keep up with	14.29	18.18	0.00	20.00	10.00	11.01	7.14	0.00	17.65
Equipment is excessively noisy	4.08	1.52	25.00	0.00	20.00	8.26	7.94	12.96	5.88
Power and/or cooling requirements are excessive	4.08	0.00	25.00	0.00	5.00	6.42	4.76	1.85	3.92
System Ratings (4.0-1.0)									
Ease of operation	3.41	3.38	3.38	3.29	3.63	3.51	3.40	3.70	3.27
Reliability of Mainframe	3.41	3.35	3.63	3.47	3.74	3.68	3.65	3.65	3.22
Reliability of Peripherals	2.95	3.03	3.25	3.07	3.25	3.31	3.26	3.15	2.88
Maintenance service:									
Responsiveness	3.06	3.14	3.14	2.93	2.83	3.35	3.26	3.09	3.06
Effectiveness	2.88	2.94	3.29	2.87	2.83	3.19	3.11	3.04	2.96
Technical support:									
Trouble-shooting	2.45	2.69	2.88	2.79	2.63	2.82	2.86	2.76	2.66
Education	2.56	2.75	2.50	2.43	2.61	2.77	2.72	2.77	2.48
Documentation	2.47	2.57	2.63	2.67	2.58	2.72	2.75	3.06	2.34
Manufacturer's software:									
Operating system	3.05	3.28	3.14	3.40	3.11	3.46	3.54	3.53	2.87
Compilers & Assemblers	2.93	3.15	3.14	3.00	3.17	3.16	3.27	3.44	2.58
Applications Programs	2.61	2.77	2.20	3.00	3.00	2.96	2.80	3.05	2.83
Ease of Programming	3.10	3.15	3.14	3.00	2.83	3.25	3.39	3.48	2.82
Ease of conversion	2.76	2.98	2.20	2.90	2.88	2.93	3.00	3.33	2.58
Overall satisfaction	2.99	3.11	3.50	3.20	3.20	3.32	3.29	3.39	2.84
Did the system do what you expected it to do? (%)									
Yes	78.57	87.69	100.00	93.33	85.00	88.99	94.44	90.74	74.00
No	10.20	7.69	0.00	6.67	0.00	3.67	1.59	0.00	14.00
Haven't decided	11.22	4.62	0.00	0.00	15.00	7.34	3.97	9.26	12.00
Would you recommend system to another user? (%)									
Yes	75.00	86.15	87.50	73.33	85.00	89.91	90.40	92.59	68.00
No	10.42	9.23	12.50	26.67	5.00	4.59	6.40	1.85	12.00
Haven't decided	14.58	4.62	0.00	0.00	10.00	5.50	3.20	5.56	20.00

© 1982 Datapro Research Corporation, Delran, N.J. 08075 USA

Survey Item	General Automation All models	Harris	Honeywell Level 6 DPS	Hewlett-Packard 250	Hewlett-Packard 1000	Hewlett-Packard 3000	IBM 1130	IBM Series 1	IBM System/3
No. of User Responses	11	16	37	5	15	206	5	45	211
No. of Systems Represented	12	16	43	6	25	251	6	57	219
Avg. Life of System (Mos.)	58.4	22.9	19.7	13.0	44.5	26.7	138.8	22.9	59.1
Acquisition Method (%)									
Purchase	45.45	12.50	83.78	75.00	80.00	72.82	100.00	84.44	71.90
Rental or Lease from Mfr.	9.09	62.50	10.81	0.00	13.33	10.68	0.00	4.44	15.71
Lease from 3rd Party	45.45	25.00	5.41	25.00	6.67	16.50	0.00	11.11	12.38
Principal Applications (%)									
Accounting/Billing	45.45	75.00	78.38	20.00	40.00	81.07	60.00	46.67	90.05
Banking—check processing/loans/savings	0.00	0.00	5.41	20.00	0.00	1.94	0.00	2.22	9.00
Construction/Architecture	9.09	0.00	2.70	0.00	0.00	2.91	20.00	4.44	4.27
Education—scheduling/administration	0.00	18.75	8.11	0.00	13.33	11.65	60.00	2.22	1.90
Engineering/Scientific	72.73	25.00	2.70	0.00	53.33	12.14	40.00	2.22	4.74
Health care/Medical	0.00	6.25	5.41	0.00	0.00	6.80	0.00	11.11	7.11
Insurance	0.00	0.00	13.51	0.00	0.00	4.85	0.00	13.33	7.58
Manufacturing	36.36	50.00	8.11	20.00	6.67	31.55	0.00	15.56	42.65
Mathematics/Statistics	27.27	18.75	8.11	0.00	40.00	13.11	20.00	6.67	5.21
Order Processing/Inventory Control	36.36	62.50	54.05	40.00	13.33	55.34	0.00	40.00	65.40
Payroll/Personnel	36.36	56.25	40.54	20.00	6.67	54.85	80.00	37.78	75.83
Petroleum/Fuel analysis	0.00	0.00	0.00	0.00	0.00	1.46	0.00	0.00	2.84
Process control	0.00	6.25	5.41	0.00	6.67	2.91	0.00	4.44	2.84
Purchasing	18.18	37.50	32.43	0.00	0.00	35.92	20.00	31.11	37.91
Sales Distribution	36.36	31.25	24.32	20.00	13.33	34.95	0.00	28.89	54.03
Other	18.18	31.25	24.32	40.00	46.67	23.30	40.00	48.89	17.06
Source of Applications Programs (%)									
In-house personnel	72.73	93.75	75.68	80.00	93.33	82.04	100.00	73.33	97.16
"Packaged" programs from manufacturer	18.18	31.25	37.84	20.00	13.33	36.89	60.00	24.44	41.23
Contract Programming	36.36	18.75	27.03	40.00	26.67	37.38	20.00	35.56	27.01
Manufacturer's Personnel	0.00	0.00	5.41	0.00	6.67	2.43	0.00	0.00	3.32
Proprietary Software Packages	45.45	25.00	37.84	0.00	33.33	53.40	40.00	35.56	10.90
Location of Computer (%)									
Distributed Processing Site	18.18	62.50	10.81	40.00	6.67	10.24	0.00	33.33	3.79
Central Processing Installation	81.82	37.50	89.19	60.00	93.33	89.76	100.00	66.67	96.21
Using Local Workstations/Terminals (%)	72.73	50.00	97.22	100.00	100.00	100.00	20.00	97.78	78.10
Using Remote Workstations/Terminals (%)	36.36	62.50	63.64	25.00	60.00	73.13	0.00	27.91	40.87
Using Data Base Management System (%)	27.27	43.75	32.43	80.00	53.33	93.69	0.00	28.89	11.37
None	72.73	56.25	67.57	20.00	46.67	6.31	100.00	71.11	88.63
Manufacturer's Package	33.33	28.57	58.33	100.00	100.00	96.89	0.00	0.00	36.36
Outside Vendor's Package	67.67	71.43	41.67	0.00	0.00	2.59	0.00	83.33	31.82
Home-Grown System	0.00	0.00	0.00	0.00	0.00	0.52	0.00	16.67	31.82
Using Communications Monitor (%)	18.18	31.25	54.05	20.00	6.67	28.64	0.00	31.11	31.28
None	81.82	68.75	45.95	80.00	93.33	71.36	100.00	68.89	68.72
Manufacturer's Package	100.00	80.00	75.00	100.00	100.00	89.47	0.00	71.43	93.85
Outside Vendor's Package	0.00	20.00	15.00	0.00	0.00	7.02	0.00	7.14	4.62
Home-Grown System	0.00	0.00	10.00	0.00	0.00	3.51	0.00	21.43	1.54
Using Integrated Word Processing Functions (%)	27.27	18.75	32.43	20.00	20.00	30.69	0.00	25.00	4.74
Planned Acquisitions/Implementations for 1982 (%)									
Additional Software from the Manufacturer	0.00	12.50	24.32	20.00	20.00	41.26	0.00	28.89	9.95
Proprietary Software from other suppliers	9.09	12.50	24.32	40.00	13.33	54.37	0.00	28.89	13.74
Expansions to Data Communications facilities	9.09	18.75	21.62	40.00	13.33	33.50	0.00	46.67	23.22
Distributed Processing capabilities	0.00	31.25	24.32	0.00	6.67	15.05	0.00	20.00	10.90
Expansions to present hardware	27.27	25.00	62.16	60.00	33.33	64.08	0.00	60.00	22.27
Another Computer System, same model	9.09	12.50	2.70	0.00	6.67	10.19	0.00	17.78	9.00
Business graphics	0.00	0.00	8.11	0.00	6.67	20.87	0.00	2.22	2.84
Plans for system replacement in 1982 (%)									
Yes, same manufacturer	18.18	0.00	2.70	0.00	6.67	10.68	20.00	0.00	30.81
Yes, vendor unknown	9.09	6.25	2.70	0.00	0.00	0.49	0.00	0.00	9.95
Yes, different vendor	9.09	25.00	2.70	0.00	6.67	0.49	0.00	0.00	4.27
No	63.64	68.75	91.89	100.00	86.67	86.89	80.00	100.00	54.03

General Automation All models	Harris	Honeywell Level 6 DPS	Hewlett-Packard 250	Hewlett-Packard 1000	Hewlett-Packard 3000	IBM 1130	IBM Series 1	IBM System/3	Survey Item
									Significant Advantages (%)
36.36	43.75	48.65	80.00	26.67	61.65	20.00	53.33	43.13	Users are happy with response time
9.09	31.25	70.27	80.00	46.67	83.98	0.00	64.44	29.86	System is easy to expand/reconfigure
18.18	12.50	10.81	60.00	0.00	11.17	0.00	24.44	11.37	System costs were less than expected
45.45	6.25	21.62	0.00	6.67	35.92	0.00	0.00	29.38	Programs/data carried over from other systems are compatible, as vendor promised
18.18	6.25	8.11	0.00	6.67	16.99	0.00	6.67	11.85	Terminals/peripherals carried over from other systems are compatible, as vendor promised
9.09	6.25	16.22	60.00	20.00	35.44	0.00	35.56	8.06	System is power/energy efficient
0.00	18.75	32.43	80.00	6.67	41.75	0.00	15.56	20.85	Productivity aids help us keep programming costs down
0.00	0.00	21.62	60.00	33.33	72.82	0.00	11.11	4.74	Data base language is efficient and effective
0.00	6.25	21.62	20.00	0.00	27.67	0.00	13.33	4.27	Delivery and/or installation of equipment was ahead of schedule
0.00	0.00	0.00	20.00	0.00	16.50	0.00	15.56	2.37	Delivery of required software was ahead of schedule
									Significant Problems (%)
9.09	12.50	27.03	0.00	13.33	7.77	0.00	11.11	7.11	Computer proposed by vendor was too small
9.09	6.25	18.92	20.00	0.00	7.77	0.00	11.11	2.84	Installation of equipment was late
45.45	18.75	29.73	0.00	26.67	6.31	0.00	24.44	0.95	Delivery of required software was late
0.00	6.25	16.22	0.00	13.33	8.25	20.00	15.56	12.32	System costs (for hardware, vendor-supplied software, support) exceeded the expected total
54.55	31.25	32.43	0.00	26.67	9.22	0.00	15.56	7.11	Vendor did not provide all the promised software or support
0.00	12.50	13.51	0.00	0.00	0.49	0.00	4.44	3.32	Program/data compatibility not what vendor promised
0.00	0.00	10.81	0.00	20.00	0.49	0.00	4.44	1.90	Terminals/peripherals compatibility not what vendor promised
27.27	18.75	16.22	0.00	26.67	4.85	0.00	11.11	4.27	Vendor enhancements/changes to hardware/software hard to keep up with
18.18	0.00	0.00	0.00	20.00	1.46	0.00	0.00	15.64	Equipment is excessively noisy
18.18	0.00	2.70	0.00	0.00	1.46	0.00	0.00	10.90	Power and/or cooling requirements are excessive
									System Ratings (4.0-1.0)
2.91	3.00	3.32	4.00	3.07	3.65	3.80	3.33	3.12	Ease of operation
3.00	3.44	3.30	4.00	3.53	3.83	4.00	3.80	3.59	Reliability of Mainframe
2.82	2.75	3.14	3.80	3.27	3.53	3.40	3.53	3.31	Reliability of Peripherals
									Maintenance service:
2.82	2.81	3.08	3.60	3.07	3.41	3.00	3.40	3.31	Responsiveness
2.82	2.56	2.89	3.40	3.33	3.44	3.00	3.38	3.25	Effectiveness
									Technical support:
2.10	2.53	2.58	3.25	2.62	3.05	2.75	2.73	2.97	Trouble-shooting
1.70	2.14	2.50	3.50	2.54	2.98	2.50	2.32	2.90	Education
1.70	2.07	2.33	3.75	2.40	2.92	2.67	2.48	2.84	Documentation
									Manufacturer's software:
2.50	3.06	3.03	4.00	3.07	3.58	3.40	2.89	3.20	Operating system
2.70	2.69	3.11	4.00	3.14	3.36	3.40	2.95	3.26	Compilers & Assemblers
2.44	2.70	2.92	3.50	2.67	3.10	3.25	2.79	2.79	Applications Programs
2.82	2.15	3.11	4.00	2.67	3.38	3.20	2.64	2.94	Ease of Programming
2.64	2.58	2.84	4.00	2.00	3.20	1.67	2.39	2.66	Ease of conversion
2.45	2.63	3.14	4.00	2.93	3.53	3.60	2.98	3.11	Overall satisfaction
									Did the system do what you expected it to do? (%)
54.55	73.33	72.22	100.00	93.33	94.66	100.00	86.67	93.30	Yes
9.09	13.33	5.56	0.00	6.67	1.46	0.00	4.44	3.35	No
36.36	13.33	22.22	0.00	0.00	3.88	0.00	8.89	3.36	Haven't decided
									Would you recommend system to another user? (%)
27.27	53.33	72.97	100.00	92.86	95.12	20.00	84.44	65.22	Yes
45.45	40.00	5.41	0.00	7.14	0.98	20.00	4.44	25.60	No
27.27	6.67	21.62	0.00	0.00	3.90	60.00	11.11	9.18	Haven't decided

© 1982 Datapro Research Corporation, Delran, N.J. 08075 USA

. . . From Basic Four to Wang

Users Rate Their Minis . . .

Manufacturer and Model / Survey Item	IBM System/32	IBM System/34	IBM System/38	Microdata All models	NCR I 8000 & I 9000	Perkin-Elmer All models	Point 4 All models	Prime 300 & 400	Prime 50 Series
No. of User Responses	13	667	231	43	49	24	8	14	58
No. of Systems Represented	17	706	238	61	51	37	9	17	75
Avg. Life of System (Mos.)	49.2	26.8	15.5	38.3	23.4	26.7	15.9	43.8	18.5
Acquisition Method (%)									
Purchase	76.92	46.47	45.45	86.05	55.10	87.50	75.00	64.29	68.42
Rental or Lease from Mfr.	0.00	46.92	38.59	2.33	32.65	8.33	12.50	21.43	21.05
Lease from 3rd Party	23.08	6.62	16.02	11.63	12.24	4.17	12.50	14.29	10.53
Principal Applications (%)									
Accounting/Billing	69.23	87.41	84.85	90.70	81.63	54.17	75.00	57.14	60.34
Banking—check processing/loans/savings	7.69	5.55	3.90	4.65	10.20	0.00	0.00	0.00	1.72
Construction/Architecture	0.00	3.00	3.46	2.33	6.12	0.00	0.00	7.14	6.90
Education—scheduling/administration	7.69	4.20	3.03	4.65	4.08	4.17	0.00	14.29	20.69
Engineering/Scientific	7.69	4.65	3.90	4.65	0.00	8.33	0.00	21.43	32.76
Health care/Medical	15.38	3.60	6.49	9.30	8.16	4.17	25.00	14.29	1.72
Insurance	0.00	3.60	6.06	6.98	4.08	8.33	12.50	0.00	1.72
Manufacturing	15.38	36.13	42.42	27.91	16.33	0.00	0.00	7.14	13.79
Mathematics/Statistics	7.69	5.25	4.33	4.65	0.00	4.17	0.00	28.57	25.86
Order Processing/Inventory Control	38.46	63.42	64.07	74.42	42.86	45.83	50.00	50.00	22.41
Payroll/Personnel	61.54	67.17	67.53	46.51	69.39	41.67	62.50	35.71	41.38
Petroleum/Fuel analysis	0.00	2.25	2.60	0.00	0.00	0.00	0.00	0.00	0.00
Process control	0.00	5.55	4.76	4.65	0.00	0.00	0.00	0.00	3.45
Purchasing	15.38	31.48	39.83	46.51	18.37	29.17	37.50	14.29	17.24
Sales Distribution	15.38	46.18	49.78	53.49	26.53	12.50	37.50	21.43	15.52
Other	0.00	17.24	20.78	16.28	22.45	37.50	62.50	14.29	31.03
Source of Applications Programs (%)									
In-house personnel	100.00	86.96	96.54	79.07	73.47	83.33	75.00	92.86	91.38
"Packaged" programs from manufacturer	30.77	49.33	39.83	30.23	57.14	25.00	62.50	28.57	29.31
Contract Programming	23.08	36.13	32.03	44.19	40.82	54.17	50.00	14.29	34.48
Manufacturer's Personnel	0.00	2.10	1.30	2.33	8.16	0.00	0.00	0.00	0.00
Proprietary Software Packages	15.38	26.39	19.05	39.53	20.41	37.50	12.50	42.86	53.45
Location of Computer (%)									
Distributed Processing Site	0.00	7.38	2.60	9.30	8.16	20.83	12.50	7.14	3.45
Central Processing Installation	100.00	92.62	97.40	90.70	91.84	79.17	87.50	92.86	96.55
Using Local Workstations/Terminals (%)	46.15	100.00	96.97	88.37	97.96	83.33	62.50	100.00	100.00
Using Remote Workstations/Terminals (%)	7.69	43.63	50.00	64.29	47.92	75.00	50.00	71.43	80.70
Using Data Base Management System (%)	0.00	8.10	82.68	93.02	12.24	62.50	25.00	50.00	50.00
None	100.00	91.90	17.32	6.98	87.76	37.50	75.00	50.00	50.00
Manufacturer's Package	0.00	57.69	95.72	90.00	16.67	53.33	0.00	66.67	55.17
Outside Vendor's Package	0.00	11.54	1.60	5.00	0.00	33.33	100.00	33.33	34.48
Home-Grown System	0.00	30.77	2.67	5.00	83.33	13.33	0.00	0.00	10.34
Using Communications Monitor (%)	0.00	19.76	23.38	9.30	2.13	50.00	12.50	14.29	33.33
None	100.00	80.24	71.62	90.70	97.87	50.00	87.50	85.71	66.67
Manufacturer's Package	0.00	87.40	96.92	25.00	100.00	58.33	100.00	50.00	76.47
Outside Vendor's Package	0.00	7.09	1.54	50.00	0.00	41.67	0.00	50.00	17.65
Home-Grown System	0.00	5.51	1.54	25.00	0.00	0.00	0.00	0.00	5.88
Using Integrated Word Processing Functions (%)	7.69	24.43	7.83	37.21	16.67	20.83	12.50	42.86	46.55
Planned Acquisitions/Implementations for 1982 (%)									
Additional Software from the Manufacturer	15.38	20.54	22.08	9.30	26.53	29.17	37.50	21.43	27.59
Proprietary Software from other suppliers	0.00	32.38	26.84	34.88	30.61	37.50	0.00	35.71	53.45
Expansions to Data Communications facilities	0.00	27.44	38.53	16.28	22.45	62.50	37.50	50.00	46.55
Distributed Processing capabilities	0.00	10.34	16.46	9.30	4.08	29.17	0.00	7.14	8.62
Expansions to present hardware	0.00	40.03	46.75	48.84	36.73	70.83	87.50	50.00	67.24
Another Computer System, same model	7.69	3.30	3.90	18.60	12.24	8.33	12.50	7.14	15.52
Business graphics	0.00	4.20	5.19	11.63	2.04	4.17	0.00	21.43	24.14
Plans for system replacement in 1982 (%)									
Yes, same manufacturer	7.69	11.54	3.46	18.60	10.20	0.00	12.50	7.14	5.17
Yes, vendor unknown	0.00	1.20	0.43	4.65	2.04	0.00	0.00	0.00	0.00
Yes, different vendor	0.00	1.20	1.30	4.65	10.20	16.67	0.00	0.00	0.00
No	84.62	85.46	94.81	72.09	77.55	83.33	87.50	92.86	94.83

IBM System/32	IBM System/34	IBM System/38	Microdata All models	NCR I 8000 & I 9000	Perkin-Elmer All models	Point 4 All models	Prime 300 & 400	Prime 50 Series	Manufacturer and Model / Survey Item
									Significant Advantages (%)
53.85	64.62	54.55	48.84	73.47	62.50	87.50	78.57	65.52	Users are happy with response time
38.46	77.96	73.59	69.77	65.31	37.50	87.50	78.57	87.93	System is easy to expand/reconfigure
30.77	12.89	14.72	16.28	18.37	12.50	12.50	7.14	15.52	System costs were less than expected
15.38	36.58	43.72	20.93	42.86	20.83	25.00	28.57	25.86	Programs/data carried over from other systems are compatible, as vendor promised
7.69	6.30	22.51	20.93	24.49	20.83	37.50	35.71	32.76	Terminals/peripherals carried over from other systems are compatible, as vendor promised
23.08	23.69	26.41	16.28	12.24	20.83	37.50	28.57	22.41	System is power/energy efficient
23.08	53.82	83.55	58.14	26.53	29.17	0.00	7.14	37.93	Productivity aids help us keep programming costs down
0.00	3.45	68.40	90.70	6.12	16.67	25.00	14.29	13.79	Data base language is efficient and effective
7.69	17.39	25.97	6.98	20.41	4.17	25.00	14.29	31.03	Delivery and/or installation of equipment was ahead of schedule
15.38	9.15	13.85	6.98	8.16	0.00	25.00	7.14	1.72	Delivery of required software was ahead of schedule
									Significant Problems (%)
7.69	7.95	6.06	20.93	14.29	20.83	0.00	7.14	12.07	Computer proposed by vendor was too small
0.00	3.30	9.09	11.63	18.37	20.83	0.00	7.14	3.45	Installation of equipment was late
0.00	4.05	2.60	13.95	14.29	8.33	0.00	7.14	8.62	Delivery of required software was late
7.69	7.65	6.49	16.28	12.24	4.17	0.00	7.14	6.90	System costs (for hardware, vendor-supplied software, support) exceeded the expected total
7.69	6.45	7.36	18.60	20.41	25.00	12.50	7.14	29.31	Vendor did not provide all the promised software or support
0.00	1.95	7.36	4.65	6.12	8.33	25.00	7.14	5.17	Program/data compatibility not what vendor promised
0.00	1.65	0.87	2.33	2.04	4.17	0.00	0.00	1.72	Terminals/peripherals compatibility not what vendor promised
7.69	5.85	7.79	13.95	10.20	58.33	0.00	7.14	13.79	Vendor enhancements/changes to hardware/software hard to keep up with
0.00	1.50	2.16	9.30	6.12	4.17	0.00	7.14	8.62	Equipment is excessively noisy
7.69	0.90	2.16	4.65	4.08	4.17	0.00	0.00	0.00	Power and/or cooling requirements are excessive
									System Ratings (4.0-1.0)
3.31	3.61	3.34	3.79	3.40	2.63	3.75	3.71	3.55	Ease of operation
3.77	3.80	3.76	3.37	3.37	3.29	3.75	3.64	3.50	Reliability of Mainframe
3.11	3.69	3.54	2.95	3.20	2.67	3.25	3.00	3.00	Reliability of Peripherals
									Maintenance service:
3.23	3.48	3.55	3.21	3.16	2.67	3.63	2.93	2.97	Responsiveness
3.38	3.49	3.50	2.98	3.13	2.50	3.63	2.79	2.73	Effectiveness
									Technical support:
3.00	3.01	3.01	2.70	2.69	2.27	3.00	2.36	2.57	Trouble-shooting
2.92	3.04	2.92	2.62	2.69	2.18	2.71	2.79	2.52	Education
2.83	3.00	3.00	2.37	2.45	2.27	2.38	2.50	2.50	Documentation
									Manufacturer's software:
3.17	3.41	3.40	3.63	3.02	2.37	3.38	3.50	3.41	Operating system
3.46	3.42	3.40	3.43	2.96	2.65	3.14	3.14	3.07	Compilers & Assemblers
3.11	2.89	2.95	2.94	2.64	2.11	3.00	3.00	2.70	Applications Programs
3.38	3.36	3.61	3.72	3.06	2.52	3.25	3.36	3.28	Ease of Programming
3.09	3.05	2.66	3.24	2.87	2.27	2.63	3.29	3.02	Ease of conversion
3.54	3.42	3.36	3.37	3.16	2.61	3.63	3.50	3.31	Overall satisfaction
									Did the system do what you expected it to do? (%)
100.00	95.05	85.22	88.37	87.76	91.30	100.00	100.00	91.38	Yes
0.00	1.95	2.17	6.98	6.12	8.70	0.00	0.00	3.45	No
0.00	3.00	12.61	4.65	6.12	0.00	0.00	0.00	5.17	Haven't decided
									Would you recommend system to another user? (%)
84.62	96.08	88.65	83.72	83.67	70.83	100.00	100.00	91.38	Yes
7.69	1.20	3.49	11.63	10.20	20.83	0.00	0.00	1.72	No
7.69	2.71	7.86	4.65	6.12	8.33	0.00	0.00	6.90	Haven't decided

© 1982 Datapro Research Corporation, Delran, N.J. 08075 USA

Survey Item / Manufacturer and Model	Prime I 1000	Qantel All models	Tandem All models	Texas Instruments 990	Univac BC 7	Wang VS	Mirnis Other models
No. of User Responses	12	6	25	32	6	87	72
No. of Systems Represented	13	6	57	39	6	107	104
Avg. Life of System (Mos.)	17.9	38.8	17.3	20.7	26.8	21.0	36.3
Acquisition Method (%)							
Purchase	75.00	83.33	92.00	81.25	50.00	72.94	73.61
Rental or Lease from Mfr.	0.00	0.00	0.00	6.25	16.67	15.29	12.50
Lease from 3rd Party	25.00	16.67	8.00	12.50	33.33	11.76	13.89
Principal Applications (%)							
Accounting/Billing	91.67	83.33	40.00	84.38	83.33	72.41	68.06
Banking—check processing/loans/savings	0.00	0.00	20.00	3.13	0.00	8.05	5.56
Construction/Architecture	0.00	0.00	0.00	9.38	33.33	2.30	2.78
Education—scheduling/administration	8.33	0.00	0.00	9.38	0.00	6.90	6.94
Engineering/Scientific	0.00	0.00	4.00	3.13	16.67	5.75	15.28
Health care/Medical	8.33	16.67	8.00	3.13	0.00	6.90	6.94
Insurance	8.33	16.67	0.00	3.13	0.00	13.79	5.56
Manufacturing	25.00	16.67	8.00	21.88	33.33	14.94	8.33
Mathematics/Statistics	0.00	16.67	8.00	6.25	16.67	5.75	11.11
Order Processing/Inventory Control	66.67	66.67	28.00	40.63	33.33	35.63	50.00
Payroll/Personnel	41.67	50.00	12.00	68.75	50.00	41.38	50.00
Petroleum/Fuel analysis	0.00	0.00	0.00	9.38	0.00	3.45	4.17
Process control	0.00	0.00	16.00	0.00	0.00	2.30	4.17
Purchasing	50.00	50.00	8.00	15.63	0.00	19.54	20.83
Sales Distribution	91.67	16.67	12.00	25.00	16.67	31.03	33.33
Other	25.00	16.67	52.00	25.00	33.33	33.33	25.00
Source of Applications Programs (%)							
In-house personnel	50.00	50.00	88.00	78.13	50.00	77.01	63.89
"Packaged" programs from manufacturer	33.33	50.00	20.00	9.38	83.33	35.63	31.94
Contract Programming	58.33	83.33	24.00	21.88	50.00	41.38	30.56
Manufacturer's Personnel	8.33	0.00	4.00	0.00	0.00	2.30	5.56
Proprietary Software Packages	41.67	33.33	28.00	50.00	33.33	32.18	31.94
Location of Computer (%)							
Distributed Processing Site	8.33	50.00	8.33	21.88	0.00	15.12	15.28
Central Processing Installation	91.67	50.00	91.67	78.13	100.00	84.88	84.72
Using Local Workstations/Terminals (%)	100.00	100.00	100.00	100.00	100.00	100.00	87.14
Using Remote Workstations/Terminals (%)	75.00	100.00	80.00	41.94	0.00	40.70	43.48
Using Data Base Management System (%)	100.00	50.00	60.00	25.81	16.67	13.79	31.94
None	0.00	50.00	40.00	74.19	83.33	86.21	68.06
Manufacturer's Package	75.00	100.00	86.67	75.00	100.00	50.00	34.78
Outside Vendor's Package	16.67	0.00	6.67	0.00	0.00	25.00	43.48
Home-Grown System	8.33	0.00	6.67	25.00	0.00	25.00	21.74
Using Communications Monitor (%)	16.67	16.67	68.00	18.75	0.00	22.99	25.00
None	83.33	83.33	32.00	81.25	100.00	77.01	75.00
Manufacturer's Package	100.00	0.00	82.35	83.33	0.00	89.47	38.89
Outside Vendor's Package	0.00	0.00	11.76	16.67	0.00	5.26	50.00
Home-Grown System	0.00	100.00	5.80	0.00	0.00	5.26	11.11
Using Integrated Word Processing Functions (%)	41.67	66.67	24.00	32.26	0.00	65.52	23.61
Planned Acquisitions/Implementations for 1982 (%)							
Additional Software from the Manufacturer	33.33	50.00	36.00	18.75	33.33	25.29	20.83
Proprietary Software from other suppliers	33.33	16.67	36.00	37.50	16.67	40.23	26.39
Expansions to Data Communications facilities	58.33	33.33	52.00	31.25	16.67	43.68	12.50
Distributed Processing capabilities	0.00	16.67	12.00	21.88	33.33	18.39	9.72
Expansions to present hardware	58.33	83.33	72.00	65.63	66.67	62.07	29.17
Another Computer System, same model	8.33	16.67	28.00	0.00	16.67	8.05	9.72
Business graphics	16.67	0.00	12.00	3.13	16.67	13.79	6.94
Plans for system replacement in 1982 (%)							
Yes, same manufacturer	25.00	0.00	8.00	0.00	16.67	13.79	6.94
Yes, vendor unknown	0.00	0.00	0.00	3.13	16.67	4.60	2.78
Yes, different vendor	0.00	0.00	4.00	0.00	16.67	1.15	6.94
No	75.00	100.00	88.00	96.88	50.00	79.31	81.94

Manufacturer and Model / Survey Item	Prime I 1000	Qantel All models	Tandem All models	Texas Instruments 990	Univac BC 7	Wang VS	Mirnis Other models
Significant Advantages (%)							
Users are happy with response time	66.67	66.67	48.00	56.25	33.33	70.11	52.78
System is easy to expand/reconfigure	91.67	50.00	84.00	84.38	66.67	78.16	44.44
System costs were less than expected	16.67	16.67	4.00	34.38	0.00	14.94	16.67
Programs/data carried over from other systems are compatible, as vendor promised	25.00	33.33	8.00	25.00	0.00	36.78	27.78
Terminals/peripherals carried over from other systems are compatible, as vendor promised	25.00	16.67	24.00	9.38	0.00	10.34	25.00
System is power/energy efficient	25.00	0.00	20.00	18.75	0.00	21.84	20.83
Productivity aids help us keep programming costs down	66.67	16.67	56.00	34.38	33.33	74.71	20.83
Data base language is efficient and effective	91.67	50.00	48.00	6.25	16.67	8.05	13.89
Delivery and/or installation of equipment was ahead of schedule	50.00	16.67	52.00	18.75	0.00	17.24	16.67
Delivery of required software was ahead of schedule	25.00	16.67	32.00	9.38	0.00	3.45	12.50
Significant Problems (%)							
Computer proposed by vendor was too small	16.67	0.00	16.00	15.63	16.67	11.49	11.11
Installation of equipment was late	0.00	0.00	0.00	6.25	0.00	12.64	11.11
Delivery of required software was late	25.00	16.67	4.00	9.38	33.33	11.49	12.50
System costs (for hardware, vendor-supplied software, support) exceeded the expected total	8.33	16.67	8.00	12.50	0.00	6.90	6.94
Vendor did not provide all the promised software or support	16.67	0.00	8.00	18.75	33.33	20.69	20.83
Program/data compatibility not what vendor promised	0.00	0.00	0.00	0.00	0.00	3.45	4.17
Terminals/peripherals compatibility not what vendor promised	0.00	16.67	4.00	0.00	0.00	3.45	0.00
Vendor enhancements/changes to hardware/software hard to keep up with	8.33	0.00	0.00	12.50	0.00	4.60	4.17
Equipment is excessively noisy	0.00	0.00	0.00	9.38	0.00	6.90	13.89
Power and/or cooling requirements are excessive	0.00	0.00	0.00	9.38	16.67	5.75	11.11
System Ratings (4.0-1.0)							
Ease of operation	3.67	3.50	3.32	3.59	3.83	3.76	3.24
Reliability of Mainframe	3.83	3.83	3.80	3.73	4.00	3.60	3.32
Reliability of Peripherals	3.27	3.17	3.08	3.38	3.00	3.05	3.18
Maintenance service:							
Responsiveness	3.50	3.33	3.25	3.00	3.17	3.00	3.20
Effectiveness	3.00	3.17	3.26	3.13	3.00	2.89	3.04
Technical support:							
Trouble-shooting	2.27	3.17	3.00	2.84	2.50	2.66	2.76
Education	2.67	2.50	3.13	2.53	1.83	2.36	2.43
Documentation	2.55	2.50	3.04	2.55	2.00	2.25	2.54
Manufacturer's software:							
Operating system	3.36	3.60	3.50	3.42	3.67	3.39	3.04
Compilers & Assemblers	3.60	3.33	3.21	3.32	3.60	3.44	2.83
Applications Programs	2.83	3.33	2.50	3.11	2.67	3.13	2.63
Ease of Programming	3.80	3.17	3.32	3.39	3.50	3.67	3.03
Ease of conversion	3.20	3.00	3.08	2.96	3.00	3.31	2.76
Overall satisfaction	3.45	3.17	3.42	3.29	2.67	3.36	2.97
Did the system do what you expected it to do? (%)							
Yes	75.00	100.00	84.00	84.38	100.00	90.80	87.14
No	16.67	0.00	4.00	6.25	0.00	1.15	7.14
Haven't decided	8.33	0.00	12.00	9.38	0.00	8.05	5.71
Would you recommend system to another user? (%)							
Yes	100.00	83.33	86.96	84.38	66.67	86.21	69.44
No	0.00	16.67	0.00	6.25	16.67	2.30	19.44
Haven't decided	0.00	0.00	13.04	9.38	16.67	11.49	11.11

© 1982 Datapro Research Corporation, Delran, N.J. 08075 USA

. . . And Their Manufacturers

EDITORIAL

Greatest Show on Earth?

If the strength of the computer industry was visible anywhere last week, it was on the floor of the Astrohall in Houston at NCC '82.

The 31st annual gathering of the computer industry was undeniably large, breaking exhibit and attendance records. Despite dismal economic conditions and temperatures that soared into the mid-90s, 684 exhibitors and an early unofficial estimate of 100,000 attendees packed the 320,000 square feet of the Astrohall and Astroarena.

As with the most recent shows, there was a serious tone about this conference, mixed with local color. Blue pinstripe suits were in fashion, but given the locale, so were blue overalls and straw Stetsons.

Despite the records apparently set last week, the show was not without its weaknesses. At least three major hardware and software vendors decided not to participate this year, apparently questioning the value of a booth at the show.

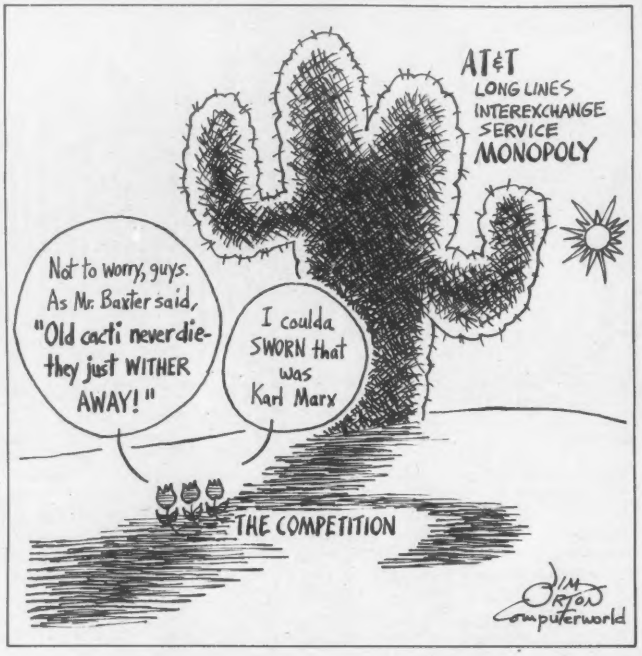
Exhibitors located in the rotunda of the Astrohall, the prime location, were pleased with their positions and with the amount and quality of floor traffic plus the extended length of time that traffic was staying in their booths.

But many attendees were confused by what appeared to be a cramped and crazy atmosphere resembling a New York disco. Those exhibitors who wound up at the end of the arms extending out from the central core of the Astrohall were understandably disappointed with their locations. And floor traffic in the adjacent Astroarena was even lighter. More than one attendee reported feeling like a mouse in a maze.

Unlike previous shows, there were few major product introductions for the mainframe environment. Most of these had been made in the two to three months before the show. But personal computers were pervasive, reflecting the exploding interest in these machines.

NCC '82 was originally scheduled for New York, but limited exhibit space in the New York Coliseum would have meant a repeat of NCC '79, where exhibits were spread out across town and attendees traipsed from hotel to hotel.

The sheer size of NCC and the feeling that it is all things to all people must again be questioned. One is forced to ask if in fact this is the greatest show on Earth — or just the largest.



DATA PAST

Five Years Ago
June 27, 1977

WASHINGTON, D.C. — The Carter administration retreated from its endorsement of the controversial message-switching system proposed by the Federal Bureau of Investigation because of a barrage of criticism. Members of Congress called the system the start of "a national police state."

— — —

NEW YORK — As a result of his testimony against IBM, a witness at the U.S. vs. IBM antitrust trial indicated his company — Control Data Corp. — would probably lose customers and had already felt repercussions.

"We'll be wearing a black hat after my testimony," Gordon Brown, senior vice-president of marketing and planning, said of CDC.

Ten Years Ago
July 5, 1972

HARRISBURG, Pa. — Hundreds of computer systems were buried under tons of water and mud last week as floods spawned by tropical storm Agnes inundated the Middle Atlantic section of the country.

Even computers that escaped the worst flooding in this century felt the effects of the storm as brownouts, blackouts and power surges swept up and down the East Coast.

— — —

SACRAMENTO, Calif. — A bill that exempted from taxation all software except that sold with a computer was signed into law by Gov. Ronald Reagan. The exemption was for two years and was intended to give the state time to arrive at a sound basis for assessing all software.

LETTERS

Profiles Unfair

I have been reading *Computerworld* for quite some time now, and the more I read, the more upset I become. It seems every issue has at least one article that refers to the psychological profile of a programmer. What upsets me is that I find the "profile" is more the exception than the rule in applications programming and often in systems programming.

I am an applications programmer and I am *not* antisocial. The vast majority of programmers I've worked with are friendly people who enjoy each other's company. They get along very well with their colleagues and with their users.

I enjoy the stimulation of a challenging project to work on, but this is not to the exclusion of all else, as the "profiles" suggest. By printing this information repeatedly as CW does, you are reinforcing the image of programmers as unpleasant people. This is untrue and unfair.

Brenda J.S. McGill
Irvine, Calif.

Strength of DES

Under the head "The Flap Over DES" [In Depth, CW, May 3], it was stated that at the insistence of the National Security Agency (NSA), the Data Encryption Standard (DES) "key length of 128 bits had been reduced to 64 bits — apparently reducing its strength by 50%."

In fact, reducing the key length by 64 bits reduces the number of possible keys by 2 to the 64th power. This decreases the difficulty of finding a key by exhaustive search by a factor of 18,446,744,073,909,551,616. Actually, since one bit in eight is used as a parity check on the DES key, the difficulty is only reduced by a factor of 2 to the 54th power or about 72 quadrillion.

In other words, the NSA change reduced the strength of DES by 99.99999999999999%. This figure should make it clear why the key length was reduced. It is possible to argue either way whether NSA can build a machine to crack a 64-bit DES. It is obviously impossible to crack a 128-bit DES unless trapdoors have been inserted into the standard.

Joaquin Miller
Lovelace Computing
Berkeley, Calif.

No Utopias

Gopal Kapur, a management consultant, recently commented about the inadequacies of the typical data processing manager ["Exec Claims DP Managers Failing to Keep Pace," CW, May 17]. He described data processing managers as incompetent, functionally illiterate, ignorant of business and interpersonal skills and poor planners who lack good communication skills.

It's obvious that Kapur is an intelligent individual, having been a college professor, but like the students entering the business community, he needs some real-life experience.

Theory is not always practical and cost-effectiveness is the key in all business situations. The DP manager is restricted by a budget the same as everyone else.

When you are responsible for production, meeting schedules and servicing the needs of the user and upper-management community, you become conditioned into believing that "If it works, leave it alone."

I don't feel this is the fault of DP management. They "fight fires" because it is the nature of the business. Granted, there is room for improvement, but there are also such things as priorities, which usually restrict the creation of a utopia.

Mike Bingle
Springfield, N.J.

READER COMMENTARY/Douglas R. Bybee‡

Ten Basic Pitfalls of DP Management

I read "No One Likes You, Speaker Tells DP Managers" [CW, May 3] with more than usual interest because I recently was privileged to an experience that reinforced Don Atkinson's postulate.

While gathering material for a textbook I am coauthoring on survival management, I took a look at three medium-size installations (with 50 to 75 employees each) and interviewed six non-DP executives to discuss their feelings about their organizations' DP departments.

I started my investigation with the conviction that if any wrongs were discovered, they would be attributable to executive misunderstanding of the DP environment. However, after the investigations and supplemented by a few days' reflections of my 20 years in the DP business, I was just as adamantly convinced that one glowing reason DP managers are so unpopular is that they are poor managers.

The interview sessions at each site were attended by the executive for whom the investigation was performed and a non-DP manager the executive considered efficient. All six attendees had years of experience as users; two were chief executive officers and two owned their own personal computers. In total, they had worked with 23 DP managers throughout their business lives and were as DP-knowledgeable as any users I have yet encountered.

I opened each discussion with the question: "As a user, have you ever been associated with a DP project you considered successful and professionally accomplished?" None had.

'DP managers should ask the question: "What do I automate and in what priority?" Believe it or not, the continuing answer to that question is usually 90% of their job. They may want their job to concern "How do I best automate?" But "how" is the jurisdiction of their subordinates.'

My second question was simply, "What do DP managers do wrong, why are they disliked and how can they improve?"

The following list of 10 indiscretions is a consolidation of their responses. The only significant change I made was to correct a few acronyms. I am the first to admit the sample is hardly significant.

Uncontrollable Factors

First, the panel decided that there are a number of uncontrollable reasons DPers are disliked:

1. Supply and demand dictate that DPers are overpaid.

2. The business of automation traditionally has forced objectivity and definition. A DP manager may demand that the marketing vice-president give him the maximum field length for SALES-DOLLARS-PER-DISTRICT or that the personnel manager detail the exact reasons for employee turnover. However, they may not know the answers.

3. No matter how much we wish otherwise, most automation projects are born of immediate need. When accounting decides to change inventory methodology, they want to hear "end of fiscal year," not "18 man-years." People don't like people who will not help them when they need help.

4. DP is a business with nonstandard terminology and even nonstandard standards. People don't like indecisiveness.

There are, however, controllable factors that DP managers too often mismanage.

1. DP managers hide in technology. The business of DP management is the business of directing, no different from directing any other activity. Management involves soliciting resources, general planning, personnel management and budgeting. It is the business of deciding to change from Isam to Vsam. It is *not* the business of evaluating the technical ramifications of the change or actually making the change.

Those of us hiring DP managers must share part of the blame for forcing a technician into unfamiliar surroundings. For some reason, DP managers (unlike other managers) have a native fear of their subordinates being more technologically proficient than they are and are reluctant to make the transition from technician to manager of technicians.

2. DP managers seldom know what is expected of their position. They need to find their "station" in the organization and work within it; an honest conversation with the organization's power brokers will usually identify their function. They might be quite surprised to learn their job is getting the paychecks out on time and has nothing at all to do with evaluating software available for book and tax asset depreciation. Conversely, they may just find out their job requires chairing a committee to standardize data elements for biochemistry research rather than producing an abbreviated student transcript.

When in doubt, DP managers should ask the question: "What do I automate and in what priority?" Believe it or not, the continuing answer to that question is usually 90% of their job. They may want their job to concern "How do I best automate?" But "how" is the jurisdiction of their subordinates.

3.DP managers often cannot manage the human component.

Every DP manager needs to address two very human problems:

a. They need to find the power brokers of their organization and use them; politics, if you will.

b. They need to hire and retain competent people.

If they don't do both, they cannot produce. If they cannot produce, it's back to being hated and eventually out of work.

DP managers seem never to come to

(Continued on Page 68)

HUMAN CONNECTION/Jack Stone‡

Manager Aims to Set Own 'House' in Order

"Respect," according to Webster's *New World Dictionary*, is "a feeling of high regard, honor or esteem." It is also the ingredient missing in the attitudes of most users toward data centers and their leadership.

Users are unhappy for a number of reasons, many of which have been noted in this column over the years and elsewhere in the trade press. Briefly reviewed, users point to long-festering management problems in the center, particularly those related to interpersonal communications, overcommitments, limited knowledge of business operations and political naivete. It is no wonder that users seldom wax enthusiastic about their computer support.

Stephen Roberts, assistant director for administration systems at Catholic University of America (Washington, D.C.), was aware of deeply ingrained user dissatisfaction when he began to address operating problems within his systems and programming group. He was very sympathetic to users who privately confessed to him: "How can I avoid being scared when I'm working with computer people? They are supposed to be the experts in management systems, but I can't tell if they really have my best interests at heart.

This is Part 7 of a continuing series on how to succeed as a data center manager.

"For instance, my entire operation is keyed to an analyst whom I can't seem to find when I need him. When he does show up, he talks in technical gobbledygook with only vague references to what is happening in my segment of the business. I don't mind him setting task priorities because he supposedly knows what he is doing, but I deeply resent it when he resets priorities without my knowledge."

Early on, Roberts set goals for his group that enable him to control his own operation. He believes that only after he demonstrates his management capabilities will his group command the respect and confidence of his users. On this basis, he hoped that user relationships would not further deteriorate after he deferred the bulk of the active tasks to relieve staff burden. He viewed this first step as absolutely fundamental to proper management: The staff must come to work during normal business hours to be available to help — and communicate with — the users.

Scheduling Snag

But it didn't work as he expected. It turned out that the vast majority of the center's active tasks dealt with production-type problems that required staff attention in the off-hours when the production job streams were running. These problems gave the staff ongoing excuses for working the "crazy" hours in spite of the reduced work loads.

Not to be outdone, Roberts, in a radical departure from decades-old center traditions, then announced that even production problems would henceforth be subjected to task prioritization and that he — not the staff — was assuming responsibility for setting those priorities. The staff was aghast.

He emphasized that priorities were essential because there was a limit on personnel resources and the staff could hardly handle a limitless number of top-priority tasks. Further, he noted, setting priorities would encourage serious analysis of how worthwhile production support tasks were. For example, many production problems were so picayune that the costs of their resolution far exceeded the benefits, and they should have been dropped from the task rosters.

Roberts believed that one of his major functions was to take a compassionate view toward and have a sensitivity for corporatewide system needs and to develop a global list of task priorities that would benefit the university as a whole. He expected that users and programmers alike should have a similar awareness but, because they shouldn't be expected to have the scope of knowledge or the long-range outlook, their primary roles should be those of advocates for their own systems.

He was also determined to increase users' involvement in systems development and operation, partly to expand their systems knowledge and expertise, partly to quiet their carping on data center performance and, perhaps most important, to begin to build an aura of DP respectability. As a first step in this direction, he offered users the opportunity to set priorities of DP tasks within their own systems areas. The results were startling. *(To be continued next week.)*

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W., Washington, D.C. 20005.

Ten Common Pitfalls of DP Management

(Continued from Page 67)

managerial grips with the problem of turnover. They develop key-person-dependent systems and blame external forces when the person leaves.

DP managers are without qualification at their worst managing "continuity." I asked each of the six people what they would do. Here are a few of their suggestions:

- Use generalized software and justify cost via turnover.
- Hire discriminatively. Look for longevity in the area, kids in school and so on.
- Intimidate. Let it be known at hiring or promoting or training time that you expect the individual to stay for some minimum length of time. If he doesn't, give a poor recommendation.
- If at all possible, never isolate a function to an individual; let no one person be your CICS or IDMS expert, even if it cuts into immediate productivity.

All organizations engage in internal politics and being a good politician may very well be the manager's most important function.

4. DP managers do not recognize time as a resource. All DP projects need to resolve the time problem up front and managers should demand to know the exact evaluation weight of the time factor. It may be much more important than $10,000 to $20,000 in extra expense, an extra tape drive or even software capabilities.

5. DP managers waste the resources of their organizations, their own time and their employees' time. Most organizations have legal departments, personnel departments, purchasing departments, research staffs and engineering staffs. DP managers seem to believe only they can perform personnel searches, follow up bids or analyze maintenance contracts.

6. DP managers are intimidated by vendors. Situations where a vendor does not deliver on time or does not honor the letter of a maintenance contract are not accepted in any other business. When the DP manager explains interrupted production by the inability of a vendor's new operating system to perform, upper management can draw one of three conclusions:

a. The DP manager is lying; he messed up the installation.

b. The DP manager did not plan (test) the new version.

c. The DP manager selected a poor vendor in the first place.

Although the long-run solution is litigation, it is a sad reflection on the entire DP industry that vendor incompetence is allowed to exist. DP managers can be spending $500,000 to $1 million a year with a vendor and for some peculiar reason think they have to accept a standard contract. Horsefeathers!

DP managers also die politically by letting vendors talk (sell) to non-DP managers in their organizations. If a vendor ever goes around a DP manager, the manager needs to come down on said vendor with both feet.

7. DP managers use a "we-they" management philosophy. DPers have to learn that they are working for company ABC, and not IBM, Burroughs or Honeywell. For example, they seem to believe company ABC has an "obligation" to train them for advancement; nothing could be further from the truth. Their company has a "need" to train them to do a specific job. DP managers need to set objectives and rewards in the terminology of company ABC.

8. DP managers organize poorly. They continually violate their own organizational structures. If the manager employs a lead analyst on a project, it is not the manager's responsibility to be actively involved with detail design. He should let the analyst grow.

9. DP managers cannot communicate. Many are lacking in basic written and verbal business communication skills. In addition, they seem to be afflicted by a desire to explain everything in the finest detail. They need to learn detail is inversely related to organizational level.

10. DP managers describe projects with terms like "leading-edge technology" or "state-of-the-art." Instead, they should be using phrases like "reduces distribution costs by 8%" or "allows sales forecasting with a four-year activity history at a design cost of . . ."

Final question: "Is there any hope?"

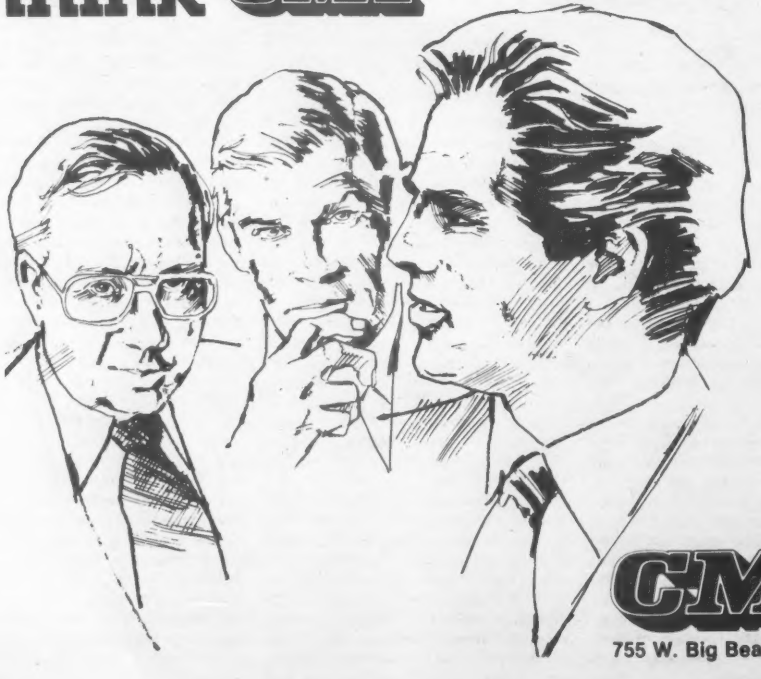
There are very few jobs around consistently as difficult as the DP manager's. One may find that company A's sales manager is under intense pressure or company B's architect, or company C's quality control supervisor. But the DP manager, particularly since information drives all aspects of the business, is almost always subject to both production and design pressure.

A DP manager's job is business-unique. It involves managing two enterprises that are often at cross purposes. On one hand, he is responsible for the mundane world of production. In this arena, he is often viewed as little more than an assembly line manager. On the other, he is expected to advise on design and promulgate and implement innovative information availability techniques. In this arena, he is often viewed as a technical guru. It's an unusual person who can handle both arenas.

If there is hope, the attendees thought it was in the growing up of the DP business. User-friendly software, compatibility of information components and distribution of small and isolated needs via personal computers outside the jurisdiction of the DP manager should all relieve the manager. And, most important, these factors should help the managers identify their jobs by reducing their alternatives.

Bybee is a partner with Downstate Media, Inc. in Springfield, Ill.

In computers, think IBM first... From that point on- think CMI



When you decide which IBM system best fits your needs, then decide on CMI. Few companies can match the level of professionalism CMI is noted for.

Our experts in Marketing, Financial Services, Operations and Sales have proven over the years that having CMI on your side is a decided edge.

S/E SUPPORT
S/E support and/or test time can be provided with a system supplied by CMI to ensure a smooth conversion.

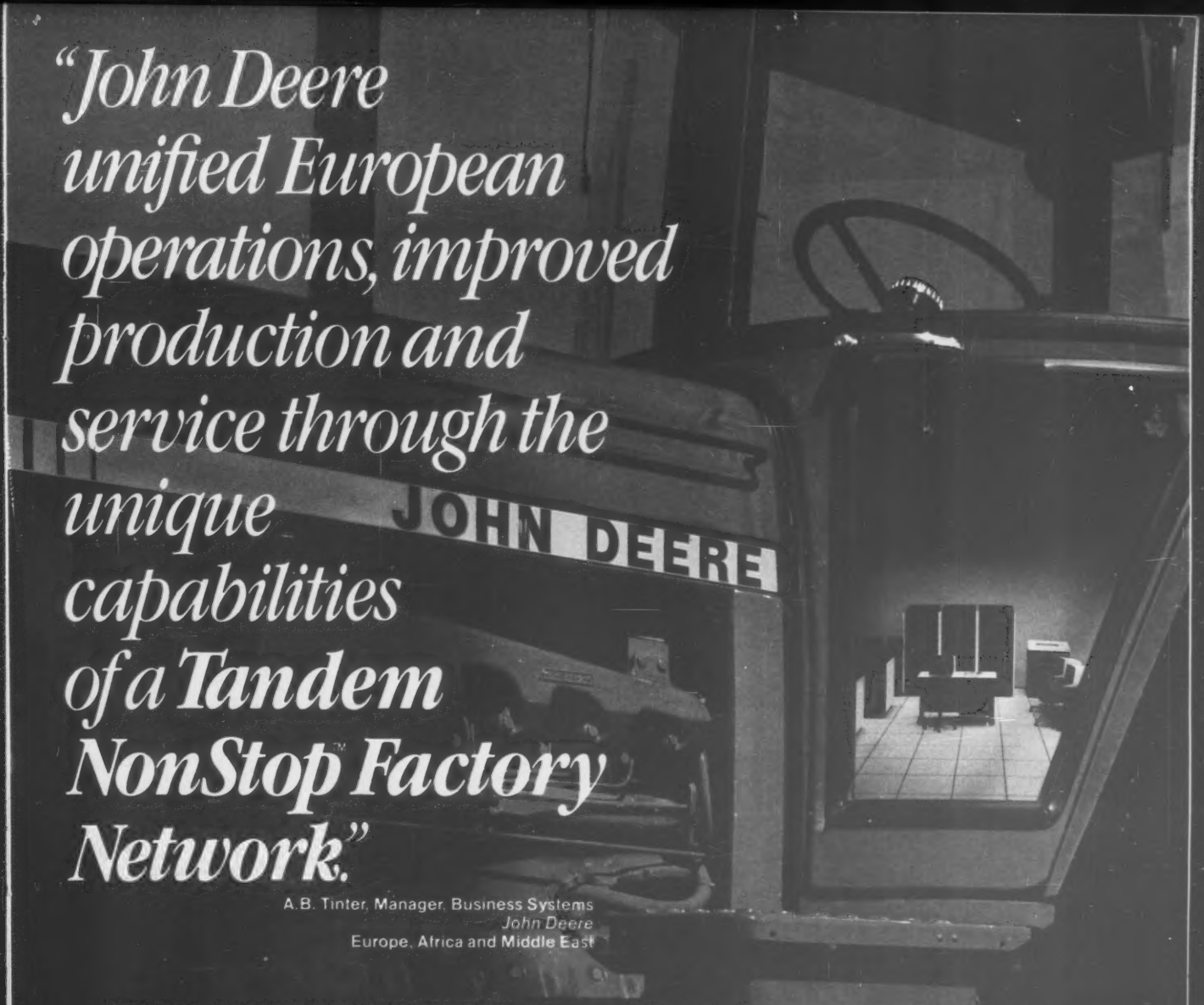
IBM ACCEPTABILITY
All CMI supplied equipment is certified eligible for an IBM maintenance agreement.

BRANCH OFFICE SUPPORT
CMI's plan is to keep you as an IBM customer running on IBM Systems.

DELIVERY & PRICE
CMI promises...Fast delivery
Lower purchase price
Lower lease rates
More flexibility

In addition, we can structure a Purchase/Leaseback on your present system and save you money while offering upgrades, lease extensions and purchase options.

CMI Since 1969 CORPORATION
755 W. Big Beaver, 19th Floor, Troy, Michigan 48084
(313) 362-1000



"John Deere unified European operations, improved production and service through the unique capabilities of a Tandem NonStop™ Factory Network."

A.B. Tinter, Manager, Business Systems
John Deere
Europe, Africa and Middle East

Manufacturing operations of all John Deere's European facilities are tied together on a network of Tandem NonStop Systems. This has enabled us to cut our computer systems costs in half; and we maintain inventories on parts, labor, materials and work-in-progress without waste and without shortage.

Decentralizing the system was important to us since it allows each factory to maintain autonomous as well as networked operation. And after two years, with the system operating Monday through Friday without interruption, we have not experienced any downtime due to failures.

Tandem came in less than half the cost of any other system for so large a task. And Tandem modularity has made it remarkably easy—and cost-effective—to expand our system to four times its original volume.

The NonStop System. The only system on the market today that can provide a dispersed network of up to 255 systems, each ranging from 2 to 16 processors, supporting thousands of terminals in an on-line, NonStop environment of data integrity, reliability and system flexibility. No one else has this capability.

The NonStop Company. Tandem. We couldn't have done it without providing worldwide support in sales, training, service and manufacturing.

For information on how a Tandem NonStop Computing System can improve your company's productivity and P/L statement, call your local sales office or Tandem Computers Incorporated, 19333 Vallco Parkway, Cupertino, California 95014, U.S.A. Toll Free 800-538-3114 or (408) 725-6000 in California.

TANDEM
NonStop Computing Systems

1982 Tandem Computers Incorporated

Because it works.

"Without Epoch 480® computer tape, I couldn't be up here this weekend–I'd be down there in the computer room."

We hear comments like that all the time from people who have switched to Epoch 480.

It tells us that Graham's commitment to a superior product really pays off.

When you consider that Epoch 480 is 50% more durable than our famous Epoch 4 computer tape, you can begin to see just how deep that commitment goes.

This extra durability means reduced head and tape wear, and a tremendous reduction in tape debris and dropouts, just for starters.

Many of our customers also tell us they always thought there was very little difference in computer tapes–which is why they bought the bargain tapes.

But since when is spending a weekend in the computer room with tape problems any kind of a bargain?

GRAHAM MAGNETICS

Toll Free 1-800-433 7632, 433 7633 In Texas (817) 281 9450

CARLISLE

"EPOCH 480" is a registered trademark of Graham Magnetics, Inc.

Modeling of Applications

Prototyping May Alleviate DP Crunch

By Brad Whitlock
Special to CW

Aside from turning every man, woman and child into a programmer, what can be done to solve the applications development backlog?

A relatively new method for alleviating the backlog problem is prototyping, or modeling of computer applications. This is an application design method involving the quick implementation of a "skeletal" model of an application which features interaction and communication with the users of that application. Refinements are made as user feedback is obtained, and the application evolves over time.

Both programmers and end users can benefit from this approach. For the programmer, a prototyped model can be a vehicle for explaining the application to the end user and receiving feedback on its accuracy and suitability. For an end user implementing his own application, prototyping can provide an enhanced means to developing an application. In this sense, it involves a cycling process whereby the application is implemented in pieces and is altered as it is used.

The problem is that implementing an application developed by a prototyping process may mean implementation never ends.

Powerful, flexible tools, such as data base management systems (DBMS) are needed to do prototyping. However, the appropriate DBMS packages are the so-called user-friendly systems, which are designed to make it easy for the user/developer to:

- Build a data base description.
- Change the data base structure.
- Load sample data.
- Get sample reports.

Moreover, the truly useful prototyping tools also ensure that the speed of implementation and increased user/developer feedback are enhanced.

The data base management systems that have a user-oriented, nonprocedural language in addition to offering relational capabilities seem to be best suited for this environment. These nonprocedural languages are intended to enable a programmer to code an operation requiring many statements in a traditional language such as Cobol or Fortran with just a few statements, or, often, just one keyword.

The nonprocedural language feature is essential for two reasons:

- The programmer gets tedious things done much more quickly.
- The ease of generating a report gives the end user and programmer a vehicle with which to communicate (the report).

The nonprocedural language aids data maintenance as well as reporting. The DBMS must make it easy to get some sample data into the data base to try out report requests.

Relational systems allow even major structure changes to be accomplished easily. Making structure changes is crucial to the prototyping process because the correct structure for the data may not be chosen the first time it is attempted.

The data description language must not only allow the description to be changed easily, but also prevent, whenever possible, the need for dumping existing data and reloading

(Continued on Page 75)

NAS Offers Programming Tool For VS/1, MVS Environments

MOUNTAIN VIEW, Calif. — National Advanced Systems, Inc. (NAS) has unveiled an Advanced Conversational Editing and Programming System (Acep) that was designed to permit programmers to create, modify and maintain programs and total systems.

Acep is intended to provide on-line time-sharing capabilities on IBM 370 series computers and NAS and other IBM-compatible processors running under the VS/1 and MVS operating systems.

An IBM System Productivity Facility (SPF) option is included to enable the user to work with screens and menus.

The Acep software reportedly allows users to enter, edit, compile, save source programs and receive output at most standard video display terminals. It includes a split-screen capability, according to the vendor.

User terminals for accessing the Acep software include the IBM 2741 and 3270 and many Ascii devices, the vendor explained.

According to a company spokesman, the terminals are supported by a wide range of communications interfaces.

The program maintenance and development functions of the Acep package were designed for both small or large programming tasks and can support projects requiring more than 100 programmers.

A license for the SPF option is available for $4,000. Monthly and term plans also are available, the vendor said from 800 E. Middlefield Road, Mountain View, Calif. 94040.

Data Base Planning Aid Backs OS, CMS, MVS Users

NORWALK, Conn. — TSI International has introduced a software package designed to support the planning, requirements and design phases of data base projects.

The package, Facets, is said to run on any IBM hardware in IBM OS, CMS or MVS operating environments.

According to the vendor, Facets is said to combine structured data base development methodologies along with data dictionary facilities in a single package.

Users and analysts reportedly can construct a functional decomposition of the business activities to be supported.

In developing detailed requirements, the user can obtain graphic representations of the local view of data.

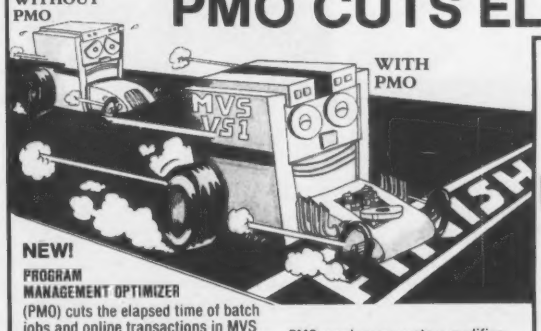
In the design phase, the package is said to produce a logical architecture for the planned data base.

The package also features a query language designed to give project team members access to their design specifications, the vendor said.

The package is available for a perpetual use fee of $15,000 from TSI International, 50 Washington St., Norwalk, Conn. 06854.

WITHOUT PMO

PMO CUTS ELAPSED TIME!



NEW!
PROGRAM MANAGEMENT OPTIMIZER

(PMO) cuts the elapsed time of batch jobs and online transactions in MVS or VS1 operating systems. PMO greatly reduces I/O contention to critical datasets, saving you time and money.

With PMO, you set records! PMO maintains performance statistics as part of its normal operations. They are available in online display or as hardcopy.

PMO requires no system modifications or user program changes. It goes up in minutes. NO IPL is required for installation or updating.

PMO has saved many users countless hours of unnecessary directory searches. Let PMO put you first across the finish line with the fastest elapsed time!

SHARED DEVICE MANAGEMENT SYSTEMS

DUQUESNE SYSTEMS SHARED DEVICE MANAGEMENT PRODUCTS provide a comprehensive solution to the problems caused by sharing data and devices. You get all of the benefits of interaction between two or more computer systems without all of the problems.

SCON

SUPERCONSOLE (SCON) helps improve operating systems productivity in MVS multi-CPU installations. By providing one console image for multi-system environments, SCON lets an operator monitor a single stream instead of many . . . reducing hardware and people costs!

SHARED DATASET INTEGRITY (SDSI) overcomes integrity problems and reserve lockouts on shared DASD . . . without system or program modification! SDSI protects data against concurrent update and eliminates device reserves with *no* user program changes.

SDSI

STAM

SHARED TAPE ALLOCATION MANAGER (STAM) manages your shared device pool with automated allocation. STAM eliminates the need for manual control and provides the ability to share tape drives and mountable disks.

DUQUESNE SYSTEMS INC

TWO ALLEGHENY CTR. • PITTSBURGH, PA 15212
PHONE: 412/323-2600 TELEX: 902 803

SYSTEM SOFTWARE LEADERS SINCE 1970

To find out why the most knowledgeable DP installations rely on DUQUESNE SYSTEMS' Products . . .

Please send me information on:

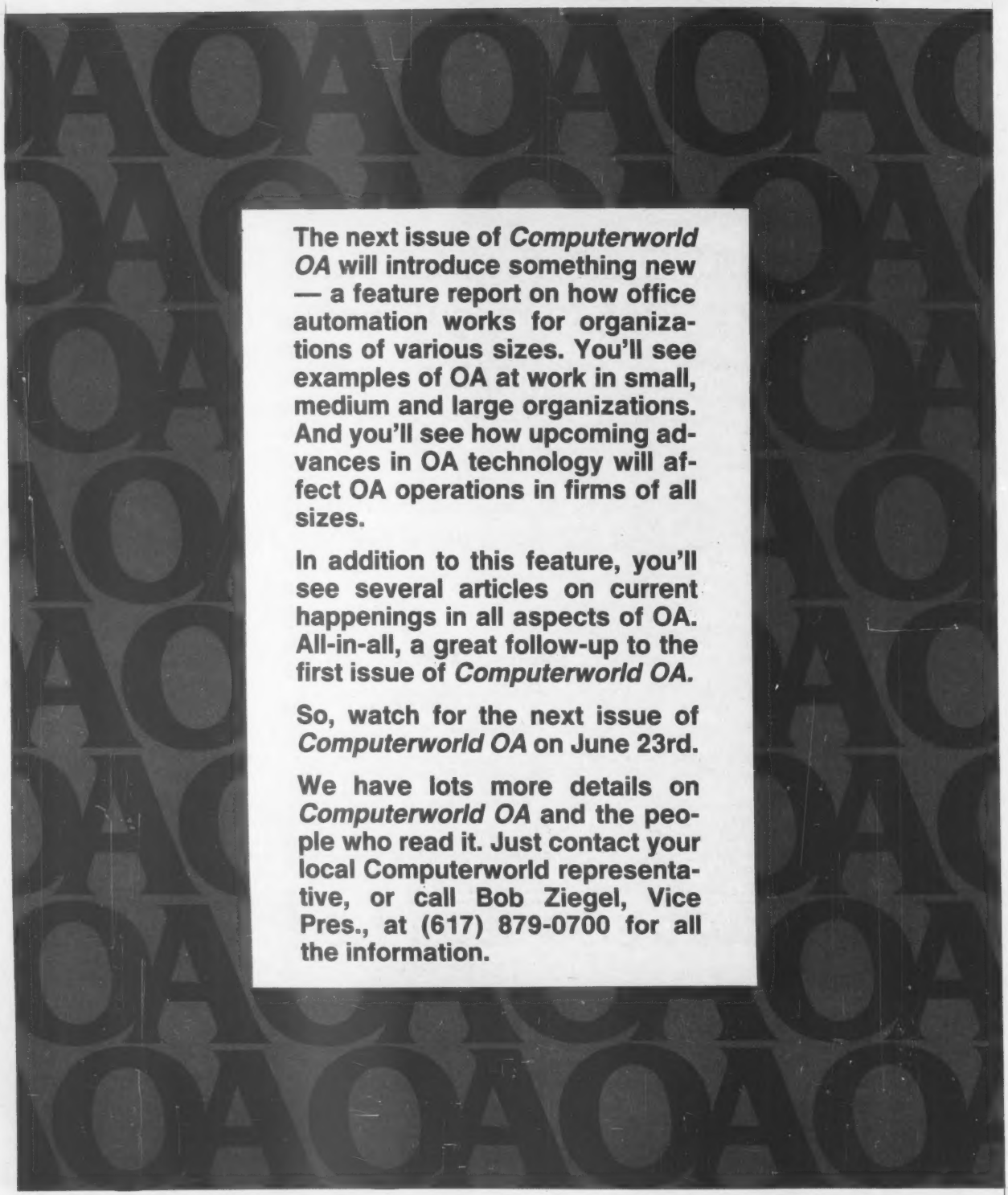
☐ PMO ☐ SCON ☐ SDSI ☐ STAM

Name _____
Company _____
Address _____
City _____ State _____ Zip _____
Tel. _____ Operating System _____

30 DAY FREE TRIAL!

Coming up in *"Computerworld OA"*

HOW OFFICE AUTOMATION CAN WORK FOR YOU!



The next issue of *Computerworld OA* will introduce something new — a feature report on how office automation works for organizations of various sizes. You'll see examples of OA at work in small, medium and large organizations. And you'll see how upcoming advances in OA technology will affect OA operations in firms of all sizes.

In addition to this feature, you'll see several articles on current happenings in all aspects of OA. All-in-all, a great follow-up to the first issue of *Computerworld OA.*

So, watch for the next issue of *Computerworld OA* on June 23rd.

We have lots more details on *Computerworld OA* and the people who read it. Just contact your local Computerworld representative, or call Bob Ziegel, Vice Pres., at (617) 879-0700 for all the information.

SALES OFFICES

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

BOSTON
Chris Lee
Ed Marecki
Joe Fitzhugh
Kathy Doyle
Diane Sukey
(617) 879-0700

CHICAGO
Newt Barrett
Jan Raska
Chris Lee
Arthur Kossack
(312) 827-4433

NEW YORK
Mike Masters
Peter Senft
Doug Cheney
Ray Corbin
Fred LoSapio
(201) 967-1350

SAN FRANCISCO
Bill Healey
Barry Milione
Ruth Gordon
Eileen Dunn
Rick Jamison
(415) 421-7330

LOS ANGELES
Jim Richardson
Bob Hubbard
Beverly Raus
Delbra Pendergrass
(714) 556-6480

Operating System Designed for Engineering Jobs

BEAVERTON, Ore. — Floating Point Systems, Inc. has announced an operating system called the Single Job Executive (SJE) for its 64-bit FPS-164 attached processor, designed to attach to IBM 4300 or Digital Equipment Corp. VAX host computers to process computationally intensive engineering and scientific jobs.

To run a job under SJE, the user's program and data files are transferred from the host computer into the FPS-164 for complete processing, the vendor explained. When the job is completed, results are returned from the FPS-164 to the host computer for further user access.

User-interactive programs reportedly are controlled in much the same manner. The host computer passes interactive information between the user's host terminal and the program running on the FPS-164.

The SJE operating system features a concise job control language, support for file and terminal I/O and runtime overlaying of program code and data, the vendor said. Temporary named or scratch files can be created on the FPS-164's disk subsystem by a program or by file transfer commands. Both interactive and batch use are supported.

The operating system is complemented by a range of program development software, including a host-resident Fortran compiler that supports a superset of the Fortran-77 language, according to Floating Point.

The SJE operating system is priced at $15,000 for domestic customers and $20,000 for international users. There is a $375/mo maintenance fee. Prerequisites for using the SJE operating system are a disk and controller, which are priced from $50,000, Floating Point Systems said from 3601 W. Murray Blvd., Beaverton, Ore. 97223.

Updated 'Audit-6' Generates All Cobol Division Programs

SAN JUAN, Puerto Rico — Audit-6 Computer Corp. has released a modified version of its Audit-6, parameter-driven Cobol generator, which is said to generate computer programs, including all four Cobol divisions.

Audit-6 runs on any computer that has an Ansi Cobol compiler, including IBM 370 and 4331 and Burroughs Corp. B-1700, B-1800 and B-2900, according to the vendor.

Originally designed to handle modular data bases, Audit-6 reportedly generates all coding necessary to validate the data items and to print report. The product is flexible enough to incorporate in the generated program, prior to the generation, any number of additional Cobol instructions supplied by the programmer.

Audit-6 is intended to reduce conversion efforts and does not require conversion of old programs.

Priced at $2,500, Audit-6 is available from Sixto Morales Garcia y Asociados, 1579 Cabalieri, URB. Caribe, Rio Piedras, Puerto Rico 00927.

Graphics Tool Runs on IBMs

PRINCETON, N.J. — Statistical Graphics Corp. has introduced Statgraphics, an interactive statistical graphics package system written in APL. Designed to run on the IBM 370, 30 series, 3081 and 4300 series mainframes, the package is said to contain more than 200 user-documented APL functions organized into 24 chapters.

Features of the package include direct access to graphics primitives, extensive use of screen panels and a split screen allowing multiple plots on a single screen, a vendor spokesman said. It is oriented toward engineering and management applications with capabilities in the area of statistical modeling, quality assurance, experimental design and time series analysis.

The package is available for a one-year lease for between $8,000 and $12,000 from Statistical Graphics Corp., P.O. Box 1558, Princeton, N.J. 08540.

Program Facilitates DEC Tape Transfer

PHILADELPHIA — Information & Financial Services, Inc. has introduced TDX20, a program said to facilitate tape transfer for the Digital Equipment Corp. Decsystem 20.

Program features include handling of nine-bit character translation, all record formats, multiple volumes and horizontal and vertical formatting protocols. TDX20 also features repetitive production jobs, error handling and built-in user assistance, including comprehensive tutorials and examples of use, the vendor said.

The program costs $3,000.

Information & Financial Services, Inc. is located in Suite 2200, One E. Penn Sq., Philadelphia, Pa. 19107.

MAXCIM™

THE DOLLARS AND CENTS ANSWER TO YOUR RESOURCE PLANNING PROBLEMS.

Operating a manufacturing plant is no small task. You need a constant flow of timely information. Not in bits and bytes. But in nuts and bolts.

MAXCIM gives you precisely that. On-line. In real time.

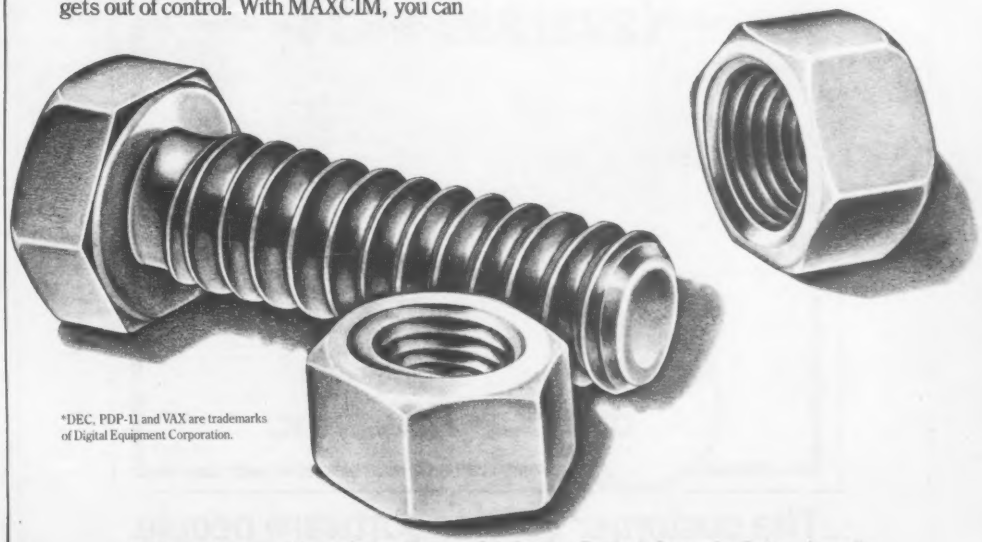
It's the ultimate planning tool... a comprehensive management information system, designed specifically to maximize productivity. And minimize your operating costs. By integrating a series of manufacturing and financial software modules through one common data base on a *DEC PDP-11 or VAX minicomputer, MAXCIM gives you constant updates on what's happening, as it's happening, anywhere in the plant... from the production line to the bottom line.

Utilizing MRP II concepts, MAXCIM provides immediate inquiry capability to manufacturing, marketing, finance and engineering, giving you total resource control. Before it gets out of control. With MAXCIM, you can monitor inventory levels. Check your work order status. Manage your entire manufacturing process... while it's still in process.

And MAXCIM's integrated design contributes to its extensive audit trail capability. MAXCIM is human-engineered, too. So you don't have to be a data processor to process the data you need. There's even a graphics module available that puts the most complex data into easy-to-interpret bar and line graphs.

Call us today. Or write for our brochure. You'll be surprised how quickly NCA can start giving you bottom line answers to your production line problems.

NCA CORPORATION
Manufacturing/ C16
388 Oakmead Parkway
Sunnyvale, CA 94086
(408) 245-7990



*DEC, PDP-11 and VAX are trademarks of Digital Equipment Corporation.

Baltimore · Boston · Chicago · Dallas · Houston · Los Angeles · Portland · Sunnyvale · Sydney, Australia

Package Fits Decsystem-20

TUCSON, Ariz. — Timesharing Consultants, Inc. has announced a fixed assets package, the FA-20, for users of Digital Equipment Corp. Decsystem-20 processors.

The package reportedly provides on-line access to information related to capital acquisitions. Features include automatic calculation of book and tax depreciation, bonus depreciation and calculation of investment credits, the vendor said.

The package costs $15,000, according to the vendor.

Timesharing Consultants is based in Suite C300, 6420 E. Broadway, Tucson, Ariz. 85710.

Word Processor Runs on PDP-11s

BERKELEY, Calif. — Pacific Software Manufacturing Co. has introduced a relational data base manager and word processor called Sequitur.

Among the hardware on which it will run is the Digital Equipment Corp. PDP-11 minicomputer and the DEC VAX-11 supermini running under Bell Laboratories, Inc.'s Unix 7 operating system.

The software provides a single screen editing interface for all interactions with the system, including data entry, data editing and data dictionary. Facilities for editing, formatting and printing documents are provided. It also provides the tools necessary to design data bases, the vendor said.

The package is available for $5,500 from Pacific Software Manufacturing Co., 2608 Eighth St., Berkeley, Calif. 94710.

Gejac Enhances SRF Software

RIVERDALE, Md. — Gejac, Inc. has introduced an enhanced version of its SRF software — SRF Version 2 Performance and Capacity Monitor.

The software runs on Digital Equipment Corp. PDP-11 minicomputers under the RSX-11M and RSX-11M Plus operating system. The software also runs under Version 4 of DEC's RSX-11M operating system.

SRF Version 2 is said to allow control over data collection by selecting the specific tasks, devices and functions that need monitoring. It prints graphic reports that provide information on CPU utilization, I/O, pool usage and fragmentation, overlay requests, task loader, checkpoint activity, shuffler activity and memory, the vendor said.

The enhanced software can be purchased on magnetic tape or floppy diskette for $3,995 for RSX-11M and $4,495 for RSX-11M Plus from the vendor through P.O. Box 188, Riverdale, Md. 20737.

Need Accounts Receivable? Need Order Entry?

300 user-years have taught us a lot about customer service software

Let's talk!

Customer Service Software is not financial software—order entry is not like payroll; accounts receivable is not like general ledger. Quite simply, Customer Service Software helps you be much more responsive than your competition to customer needs and at the same time improve your collection efforts and cash flow. Isn't that what being in business is all about?

Computeristics has successful installations in large corporations like Standard Oil (Indiana), as well as in dynamic growth companies like Ocean Spray Cranberries. But do ask for our complete reference list, not just a couple of showcase accounts.

If your mainframe is IBM 370 compatible, let's talk about our CustomAR and CustomORDER systems.

Call us now, while you're still thinking about it.

(203) 288-2834

Name/Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Computer _____
(make, model, operating system, TP monitor, file access)

Telephone _____

Mail to: Michael Mettler,
Computeristics, Inc.
2 Skiff Street
Hamden, CT 06514

computeristics®, inc.

CW/6-14

The customer service software people

T/S Firm Offers Graphics Tool

ROSLYN, N.Y. — Remote Computing Corp. (RCC) is offering an enhanced version of the Merlin graphics software package, which includes all sectors of Standard and Poor's industry groups. Remote Computing is a time-sharing company.

With Merlin graphics, corporate and individual users will have the ability to chart and analyze one industry group against another, as well as individual stocks within a group, according to the vendor.

For as little as $3 a chart, users can plot any security on the New York, American and over-the-counter exchanges, in addition to all bonds, options and commodities from every major exchange, the vendor said. All types of charts can be generated, including high, low or close; volume bars; dual securities; open interest for commodities and options; and price spreads.

RCC charges fees in accordance with CPU time used, it said from 1044 Northern Blvd., Roslyn, N.Y. 11576.

Asset System Targets Banks Using IBM 370

CUPERTINO, Calif. — Tymshare, Inc. has announced an asset and liability planning system for finance and investment officers using IBM 370 computers.

The Asset and Liability Planning System was designed to help banks determine the effects of investment decisions on their profitability. The average cost of installation is $5,000, a spokeswoman said.

An example of Tymnet network costs is an eight-report prime-rate scenario, which would cost $100 to $150, the vendor spokeswoman estimated.

Tymshare is located at 20705 Valley Green Drive, Cupertino, Calif. 95014.

Applications Run on Reality

IRVINE, Calif. — JES & Associates has announced a line of applications programs for the Microdata Corp. Reality processors.

Packages include accounts receivable, accounts payable, general ledger, payroll, job costing and order entry, the vendor said.

Packages cost between $1,500 and $4,000, according to the vendor, who can be reached through P.O. Box 19274, Irvine, Calif. 92713.

Two Cobol-Based Packages Available for Maintenance

TEMPE, Ariz. — Computers Et Cetera of the Foundation for Software Engineering has made available two Cobol-based utility packages for abbreviation expansion and program maintenance.

Speedcobol is an abbreviation expander for reserved words and phrases, data names, condition names, file names and any other string of one to 30 characters, the vendor said. Speedcobol precompiles the abbreviations to their full length.

With Readcobol the user can run existing Cobol programs to establish program structure standards, according to the vendor. The standards are maintained automatically by Readcobol. Paragraph sequencing, standard structuring and stylizing are automatic.

Both products are available on a permanent license basis of $5,000 each and were designed to run on any system with a Cobol compiler, according to Computers Et Cetera at Suite 111, 524 W. Broadway, Tempe, Ariz. 85282.

System/38 Gets 'Insight'

NEW YORK — Interactive Program Products, Inc.'s financial modeling and reporting system is now compatible with the IBM System/38 minicomputer.

According to the vendor, Insight was formerly only available to users of the IBM System/34.

It is a menu-driven budget planning, forecasting and graphics package that also features a general ledger module and report writer functions.

The system was designed for financial executives and accountants with no programming or computer background, the vendor said.

The purchase price of Insight/38 is $17,000; Interactive Program Products is located at 800 Second Ave., New York, N.Y. 10017.

Prototyping For DP Crunch

(Continued from Page 71)

it. Critical to the entire prototyping process is the ability to change report formats quickly, based on user feedback.

Suppose a report called for employee numbers, names, departments and managers.

The request might be the following: LIST BY EMPNAME DEPT MGR.

If reports are produced with more traditional tools, a massive recoding effort might be in store for the developer to reflect user-proposed changes.

This task, and others very much like it, can be made much simpler with a nonprocedural reporting language.

Whitlock is senior product manager for DBMS Marketing at National CSS in Santa Clara, Calif.

'We Call It the Repair-Free Terminal Because It Can't Be Fixed.'

Loan System Goes On-Line

DALLAS — University Computing Co. has announced an on-line component of its Instalment Loan System.

The Instalment Loan Online System (ILO) is comprised of three areas: data entry, reconciliation and data inquiry.

Written in Cobol to operate in an IBM CICS environment, ILO is available for users of IBM and plug-compatible systems in DOS/VS and OS/VS environments supporting IBM 3270 terminals.

ILO costs between $12,000 and $15,000 from the firm at UCC Tower, Exchange Park, Dallas, Texas 75235.

Harris Unveils Ada Language

MELBOURNE, Fla. — Harris Corp. has introduced a Process Description Language (PDL) for Ada, the new high-order language adopted by the Department of Defense.

The PDL is both a language and a methodology for the derivation and description of processes and data, the vendor explained. Its basic units are packages, tasks and subprograms.

The PDL software reportedly is independent of its implementation language and can be used for development of software in any high-order or assembly language.

It is available in a 100-page guide that costs $20 from Harris Corp., Government Systems Group, P.O. Box 37, Melbourne, Fla. 32901.

Only one publication in the computer field offers weekly frequency, newspaper format, paid circulation and editorial excellence all together.

We think that's why we're the most successful.

By almost any measure (including the *Folio 400* list) *Computerworld* is one of the most successful specialized business publications in the world. And we achieved that success in 15 years, because, we believe, we had a better idea. Or maybe we should say four better ideas:

1. Weekly Frequency.

In a business that changes as rapidly as ours, there is a real need for weekly publication. As one of our ads says: "If the auto industry had done what the computer industry has done in the last thirty years, a Rolls Royce would cost $2.50 and get 2,000,000 miles per gallon." According to some research we've seen, weekly frequency also has benefits for advertisers wanting to increase the impact of their campaigns over time. (We'd be happy to send you a copy.)

2. Newspaper Format.

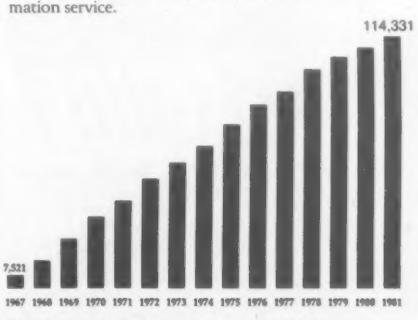
Our newspaper format is also geared to a rapidly changing field because it allows our readers to get the greatest amount of information in the shortest amount of time. We don't cover a few things in depth, like a monthly magazine, but hundreds of things quickly. We provide the information our readers need, in the amount they need, and in a format they can cope with efficiently. Research shows that more than 85% of our readers scan our newspaper from front to back, looking at every page, and stopping to read articles or ads that catch their interest.

3. Editorial Quality.

We have devoted a lot of attention to the quality of our editorial product, including regular research among our subscribers. And we think our philosophy of paid circulation has been an important contributor to our editorial quality and integrity. As one of our ads put it: "Our editor can't be bought. Our subscribers have already paid for him."

4. Paid Circulation.

Paid circulation is the hard way to big numbers, and most advertisers and agencies want to see those numbers. But we believe that paid circulation is worth the lost revenue and extra trouble, because it means extra reader involvement and support. All of our significant competitors offer free subscriptions, so our subscribers have always had several no-cost alternatives to choose from. That makes our rapid circulation growth over the years an even more impressive indication of the fact that we are providing a uniquely important information service.



Computerworld now has more than half-a-million computer-involved readers around the world every week, and we'd be happy to tell you a lot more about us and them. Just call your local sales office or Don Fagan, Vice President, Sales at (617) 879-0700.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Published by CW Communications/Inc., the world's leading publisher of computer-related newspapers and magazines.

System Converts Programs To Run on Nova Compatibles

TUSTIN, Calif. — Dynamic Concepts, Inc. has introduced a business Basic conversion program to allow users of Data General Corp.'s Rdos operating system to convert programs to run on DG Nova-compatible systems and peripherals under Dynamics Concepts' Basic Interactive Timeshare System (Bits) operating system.

Under the conversion package, users create text files on Rdos for programs to be converted, the vendor said. Bits is then booted and the conversion package is used to move selected text programs onto Bits. A translator then reads the Rdos programs contained in the copied files and converts them into Bits syntax.

The resulting system is faster than the Rdos Business Basic, particularly in disk I/O, the vendor claimed.

Bits features are said to include common variables for linked programs; multistatement program lines; logical AND, OR and ELSE operators; input statement with time-out or character limit; and program control of echo, tabbing, parity and other parameters.

The conversion package will be available after June 1 for $1,000.

Further information about the conversion package and Bits is available from Dynamic Concepts at 14712 Franklin Ave., Tustin, Calif. 92680.

Dental Tool Fits DG Units

MIAMI — Colonial Data Systems, Inc. has developed a dental patient/practice management system for Data General Corp. computers.

Written in Interactive Cobol, the Dental Data System (DDS) is said to be fully interactive and user-friendly. The accounts receivable segment of the software package, including patient billing, patient history, insurance claim processing and patient recall, costs $5,000. An appointments module costs an additional $1,500, as does an inventory module.

The software reportedly runs on any DG equipment, from CS5 to MV8000. The firm is located at 8080 N.E. 5th Ave., Miami, Fla. 33138.

Package Out For Churches

MEMPHIS, Tenn. — General Data Consultants, Inc. has released a church-oriented software package for users of Mini-Computer Business Applications, Inc. (MCBA) packages on Data General Corp. Commercial Systems series of minicomputers.

The Administrator consists of membership and stewardship modules that include member/prospect inquiry, report generation and Sunday-school administration, as well as contribution processing, quarterly statements and audit trails, the vendor explained.

The package reportedly can be combined with standard MCBA accounts payable, payroll and general ledger modules to form a church management system. The software costs $5,000 from the firm at 606 S. Mendenhall at Poplar, Memphis, Tenn. 38117.

Forms-Building Software Designed For HP 1000s

HAWTHORNE, N.J. — Combs & LaRobardiere Systems, Inc. (C&L) has announced an interactive CRT forms-building package for users of Hewlett-Packard Co.'s 1000 line of minicomputers and microcomputers.

Qform operates on any HP block-mode terminal and consists of an editor and a set of user-oriented programmer support subroutines, the vendor explained. Fields can be assigned in alphabetic only, numeric only or alphanumeric. They can also be specified to have any of the video display enhancements HP terminals support, and they can be tagged with labels for program independency of later form changes.

The library reportedly supports the displaying and erasing of forms, and function key definitions and labels can be loaded via subroutines.

The price for the Qform software is $995; C & L is located at 55 Peach Tree Court, Hawthorne, N.J. 07506.

VAX SOFTWARE!

PACS™ with EZLOG™ is today's standard in:

Resource Accounting
Performance Monitoring
Internal/External Billing
Project-Based Accounting

PACS with EZLOG can be yours with a telephone call. Get details now.

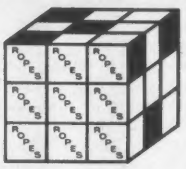
STI Signal Technology, Inc.
5951 Encina Rd., Goleta, California 93117 (805) 683-3771
Outside California Call Toll Free (800) 235-5787

VAX is a registered trademark of Digital Equipment Corporation

ROPES™

HAS THE SOLUTION TO ON-LINE PRINTING UNDER CICS

Remote On-line Print Executive System



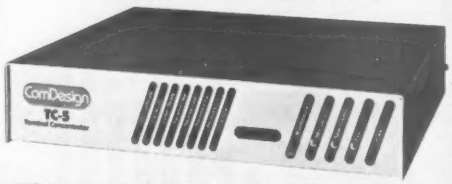
FEATURES:

- Device-independent application programming
- Flexible report routing and control
- Full user-management of printer network
- On-line and batch report generation
- Command and Macro level support
- Extensive user documentation
- Complete recovery from CICS and printer outages
- JES and POWER retrieval also available

AXIOS PRODUCTS, INC.
2364 Middle Country Road
Centereach, NY 11720

CALL NOW FOR FREE TRIAL 516-588-5461

Bring it all together



With our new TC-5 Terminal Concentrator

The advanced, easy to use statistical multiplexer for up to 16 asynchronous terminals, over a single telephone line

- STATISTICAL MULTIPLEXING — Efficiencies to 400 %
- COMPLETELY TRANSPARENT — No hardware or software changes
- ENHANCED STANDARD FEATURES — Fully supports dial-up modems, Break, Autobaud, ECHOPLEX, and auto-restart
- EXCEPTIONAL FLEXIBILITY — Configure each port separately to ANY popular baud rate, character format, flow control, etc.- while other ports are active !
- PROVEN RELIABILITY — TC-5s are in use world-wide
- EXCELLENT SAVINGS — The cost-effective solution to your communications needs
- ELIMINATES ERRORS — Fully automatic error correction
- COMPREHENSIVE DIAGNOSTICS — Automatic self-tests, modem loop-back, and built-in error counters
- FAST, FRIENDLY PROGRAMMING — Program all parameters from either unit, using only the English display and three front-panel buttons-ALL in just seconds !
- BUILT-IN SYSTEM MONITORS — Real-time signal and data displays

For further information and the sales office for your area Call toll-free (800) 235-6935 or in Calif. (805) 964-9852

ComDesign

ComDesign, Inc.
751 South Kellogg Avenue
Goleta, California 93117

RSTS/E & RSX-11M
SOFTWARE PACKAGES

KDSS a multi-terminal key-to-disk data entry system.

TAM a multi-terminal screen-handling facility for transaction-processing applications.

FSORT3 a very fast record sort for RSTS/E.

SELECT a convenient, very fast package for extracting records that meet user-specified selection criteria. (RSTS/E only.)

BSC/DV a device driver for the DEC DV11 synchronous multiplexer that handles most bisynchronous protocols. (RSTS/E only.)

COLINK a package that links two RSTS/E systems together using DMC11s.

DIALUP a package that uses an asynchronous terminal line to link a local RSTS/E system to a remote computer system. Supports file transfers, virtual terminals, and dial-out through a DN11.

Evans Griffiths & Hart, Inc.
55 Waltham Street
Lexington, Massachusetts 02173
(617) 861-0670

STRATUS VS. TANDEM

(Or how the hardware fault tolerant solution has made the software fault tolerant solution obsolete.)

"If you drive down the cost of physical hardware, you can make typically redundant paths for less money. Not surprisingly, most redundancy breakthroughs that will occur happen in hardware rather than in software.

You can build a double computer inside one box for less dollars, as opposed to doing it in software, which continually needs maintenance and revision, as well as improvement."

by Aaron Goldberg
of IDC which
appeared in *Computerworld's*
December 28, 1981 issue.

STRATUS/32–SYSTEM HIGHLIGHTS

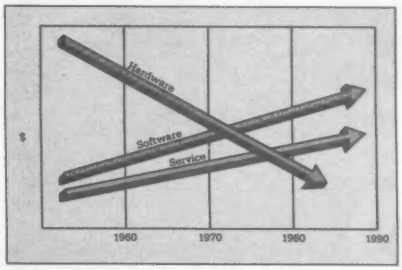
1. A simple hardware solution to fault tolerance that totally eliminates the need for extra application design and additional programming.
2. A design without performance penalties for fault tolerant operation–NO CHECKPOINTING!
3. A computer that pinpoints and isolates its failures, so repair is made quickly and inexpensively.
4. A system that can expand to 32 Fault Tolerant Processing Modules under a "single system image."

Now that the computer age is in full stride, 100% availability is fast changing from a luxury to a necessity. Downtime and its costs are unacceptable, especially when there is an alternative. Now that fault tolerant operation is becoming a universal requirement, there is demand for an improvement over the software approach used by Tandem. These computers must provide better performance, be easier to use, be easier to program and re-program, be less complicated and less expensive. We believe that the Stratus hardware based fault tolerant system answers these demands. Let us explain.

Why more hardware is better than more software.

The crux of the problem with software based systems is that they require complex, performance stealing software to provide fault tolerant operation. This software robs the system of precious resources because it uses processing cycles to pass status and checkpoint information back and forth between two computers. What's more, this passing of information occurs at four levels: operating system, user program, file management, and terminal control.

Stratus, meanwhile, has eliminated all this reliability software by having duplicate hardware components tightly coupled, dedicated to performing the same tasks at the same time. It's like having two computers in one, rather than two separate computers. Checking hardware logic detects errors with no performance loss and stops failing components instantly. The duplicate partner continues without interruption, unaffected by the failure. This is all transparent to the programmer and the user. With Stratus, there is no performance or data loss when there is a failure, no operator intervention, and no special programming.

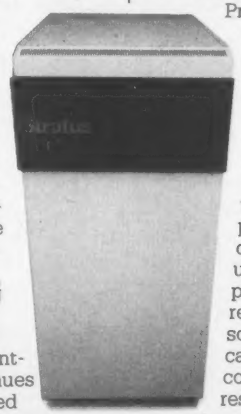


While software costs will rise because they are people dependent, experts agree that hardware costs will continue to fall.

Why Stratus is easier to implement.

The Stratus designer and programmer might as well be dealing with a conventional computer; one of them, not two. Programmers are in a familiar environment. By providing industry standard languages, applications can be moved over without redesign or major reprogramming. Fault tolerant operation is a bonus, not a complex effort.

With the software based solution the system designer and programmer is working with two computers. (An environment unfamiliar to most designers and programmers.) This approach requires more experienced personnel, takes more time for application development, requires continual maintenance, and as a result is more costly.



$130,000–Software included.

The Stratus concept could not have been executed 10 years ago, 5 years ago, or even 2 years ago. It is possible now because of the dramatic price drop of hardware components. Because of this lower cost of hardware, and because of the simplicity of its architecture, Stratus can offer Continuous Processing™ at a price competitive with traditional systems that don't offer this capability. A fully duplexed configuration with 2 megabytes of memory, peripherals, and software can be purchased for under $130,000.

Don't overlook our software.

To complement our hardware approach to Continuous Processing we have an impressive list of software. For instance: Virtual Operating System (VOS), Transaction Processing System (TranPro), Data Management System, CRT oriented command language, Cobol, Basic, PL/I, Fortran, Pascal, Networking using X.25, IBM Communications, full screen editor, symbolic debugger, forms designer and a complete Word Processing package.

If your application requires total reliability, if you are considering any kind of dual-processor configuration or if you're considering Tandem, then you should fill out our coupon or call Nick Bologna, Director of Product Marketing 617/653-1466.

See us at NCC booth 2732

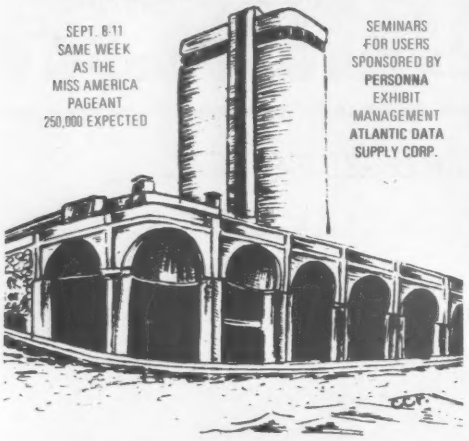
Stratus Computer, Inc. CW3
17 Strathmore Road, Natick, MA 01760

Name
Title
Company
Type of Business Phone
Address
City State Zip

Stratus
CONTINUOUS PROCESSING™

THE FIRST PC SHOW - ATLANTIC CITY, N.J.

SEPT. 8-11
SAME WEEK
AS THE
MISS AMERICA
PAGEANT
250,000 EXPECTED



SEMINARS
FOR USERS
SPONSORED BY
PERSONNA
EXHIBIT
MANAGEMENT
ATLANTIC DATA
SUPPLY CORP.

"PC + 1"
GOLDEN NUGGET
HOTEL/CASINO
EXHIBITORS INCLUDE:
QUANTUM, ITT
B & L, AERONCA,
EXECUWARE, ADS.
ENSIGN, H. SAMS
ADV. OPER. SYSTEMS
BRADY PUBLISHING

LIMITED TO 94 BOOTHS
CALL
800-526-0968

'Chicken/3000' Editor Runs On Terminals Using HP 3000

EAST LANSING, Mich. — Forest Computer, Inc. has released a full-screen, block-mode editor designed to run on any of Hewlett-Packard Co.'s or compatible block-mode terminals running under the HP 3000 system.

The Chicken/3000 editor is said to provide flexibility in the creation and modification of source code. The compilation of source code, the running of other programs as well as the execution of HP's Multiprogramming Executive commands can be done without interruption of a Chicken/3000 session.

Licensees will also receive three utility subsystems. Hatch — a Cobol source code preprocessor — allows the use of IF-ELSE-END-IF, DO-WHILE, DO-UNTIL and Case structures, reformatting these structures into a format acceptable to the Cobol compiler, the vendor explained.

A Cobol cross-reference utility aids in program development, review documentation, debugging and maintenance, the vendor said. Source listings with layout documentation, data items use file and record layout, alphabetic cross-references and paragraph and section maps can be produced in as many different combinations as desirable.

Perpetual license fee for the Chicken/3000 is $6,000. A one-year license fee is $2,275, which includes a $1,000 initial fee and $1,275/year lease fee. A demonstration tape is available for $25.

Further information on the Chicken/3000 is available from the vendor at Forest Computer, Inc., P.O. Box 1592, East Lansing, Mich. 48823.

IN A SERIES 1 COMPUTER DATA SECURITY

I HAVE payroll records ! SEND me $250,000 in Small BILLS, O.R. I'll Spill the B...

SUBJECT:

PAYROLL RECORD THEFT

You may never experience such a threat, but why take that chance? Protect your sensitive computer data with DEF™, the Data Encryption Facility that puts computer security where it belongs — in the data itself. DEF uses data encryption in the process of converting data to unintelligible code to render data useless if stolen or accessed.

For decades the military and other governmental agencies have used encryption to protect their secrets. Applied Software now offers this proven technique to industry and government with DEF — the ultimate in data security. Based upon the U.S. National Bureau of Standards Data Encryption Standard, DEF generates virtually unbreakable code.

DEF features user-friendly support for:
- Batch Processing
- TSO
- Data Base Applications
- COBOL, PL/I and FORTRAN Applications
- FSE (Applied Software's Full-Screen Editor)

NOTE:

ENVIRONMENT:
DEF™ may be installed on any IBM or plug-compatible CPU with MVS, SVS or MVT operating systems. Additional operating systems will be supported in the near future.

Serious inquiries only, please

Applied Software, Inc.
4440 P.G.A. Blvd., Suite 204
Palm Beach Gardens, FL 33410
(305) 626-4836

Tool Interfaces Programs, 3270

NOVATO, Calif. — An on-line interactive package designed to provide an interface between an applications program and an IBM 3270 display terminal has been developed by Tomark, Inc.

Screen-Aid was designed to operate in an MVS TSO environment using Tcam or Vtam. The interactive facility reportedly can be invoked from an applications program written in Cobol, PL/I or assembler.

A free 30-day trial is offered. Introductory price for the software is $6,950 from Tomark at Suite C-1, 250 Bel Marin Keys, Novato, Calif. 94947.

Company Introduces Fortran Coding Guide

ESTILL SPRINGS, Tenn. — A Fortran coding guide has been introduced by Associated Technology to aid software departments in formalizing their own standard practices.

The 40-page guide is said to provide an easily applied methodology that ensures the construction of top-down programs that are structured, testable and easy to maintain.

The guide is available for $20 from Associated Technology, Rt. 2, Box 448, Estill Springs, Tenn. 37330.

Graphics DP Service Gets Slide Option

FAIRFIELD, N.J. — The Rapidata Division of National Data Corp. has announced a 35mm slide option for its interactive Graphics computer service.

The feature can be activated by use of a SLIDE command. Slides will then be delivered to the user within four working days, the vendor said.

Slides can be produced of any plot, chart or graph prepared through the Graphics service. The service is billed on an as-used basis plus a $23/slide charge, the vendor said from 20 New Dutch Lane, Fairfield N.J. 07006.

Now when the mainframe has the data you need locked up...

you don't have to worry about being locked out.

Your monthly forecast is due tomorrow. And (what else is new?) the report on last month's results won't arrive for a couple of days. Do you guess at last month's numbers—or spend an afternoon trying to chase them down by phone?

With an HP 125 personal computer, you can get everything you need—reports, updates, facts and figures, straight from the data center as soon as they're available.

Press a key and the HP 125 becomes an intelligent terminal—so you can tie into virtually any computer. And, with LINK/125 software you can transfer files and access HP 3000 data bases—all at the push of a button.

Maybe you want to send your quarterly sales projections to the main office to become part of a corporate report. In no time, you can get the information you need from the DP center. Then, using VisiCalc® software, you can develop your "what if?" forecasts. And with the HP 125's graphics capabilities you can plot out the figures for your presentation on colorful charts and graphs.

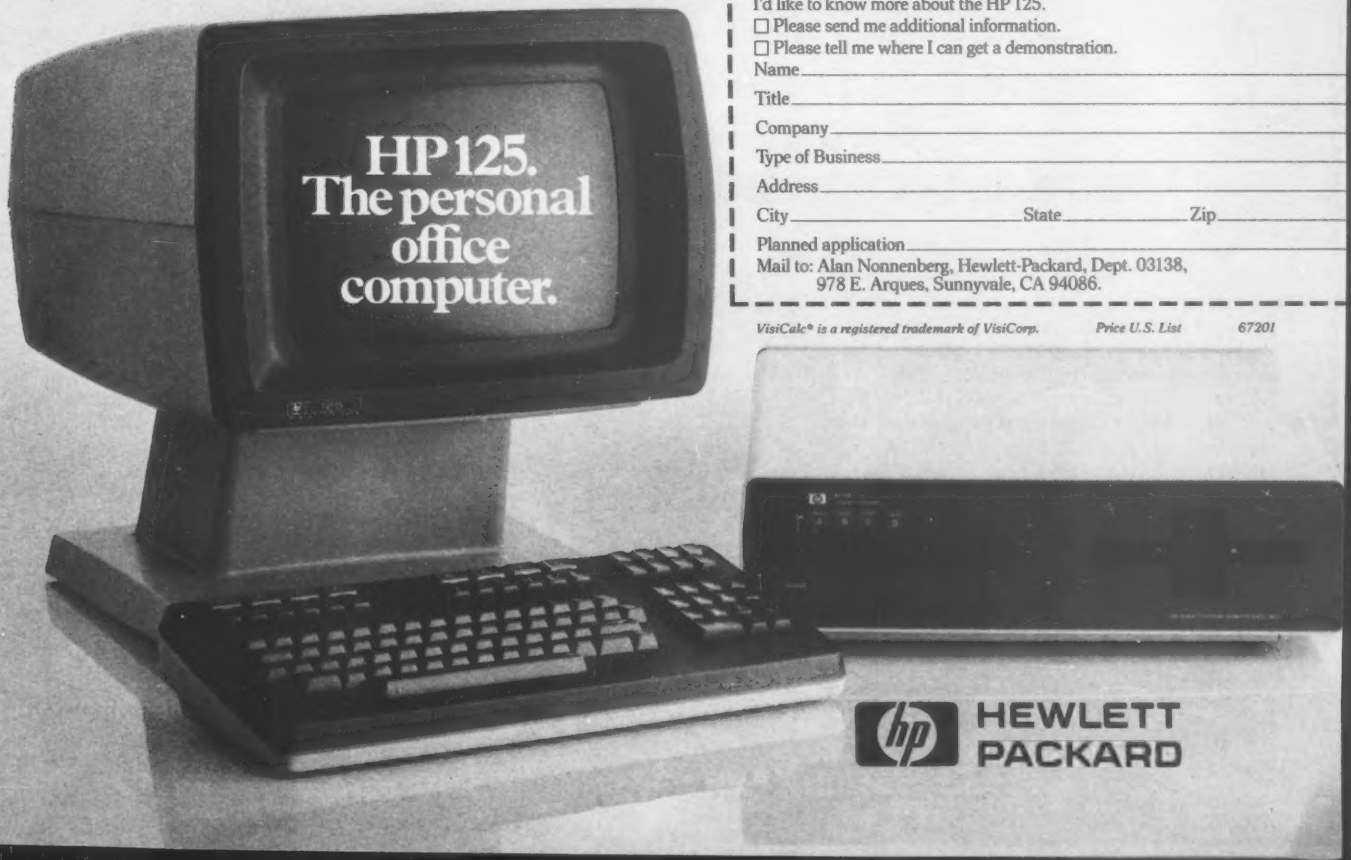
But the HP 125 goes far beyond linking the DP information *inside* your company. It can help you reach out for services like stock and bond prices, airline schedules or any of the latest wire service news. It can even send or receive electronic mail!

Prices for HP 125 systems, including processor, keyboard, display and dual 5¼" flexible disc, start at **under $5,000.** Bigger discs and a wide range of printers, plotters and software are also available. With attractive discounts if you buy in quantity.

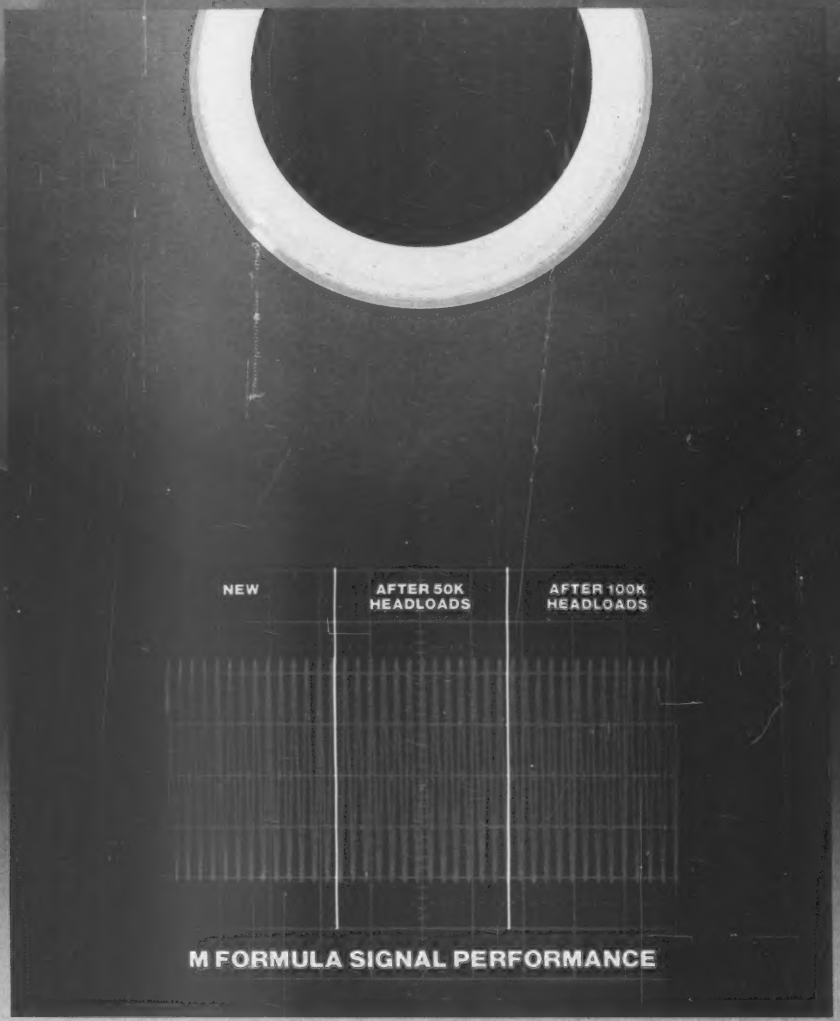
For more information, call your local Hewlett-Packard sales office or authorized HP Personal Computer dealer. Or send in the coupon below.

I'd like to know more about the HP 125.
☐ Please send me additional information.
☐ Please tell me where I can get a demonstration.
Name_____
Title_____
Company_____
Type of Business_____
Address_____
City_____ State_____ Zip_____
Planned application_____
Mail to: Alan Nonnenberg, Hewlett-Packard, Dept. 03138,
978 E. Arques, Sunnyvale, CA 94086.

VisiCalc® is a registered trademark of VisiCorp. *Price U.S. List* *67201*



HEWLETT PACKARD



Buy M Formula for its strong signal. Because over time the reason you bought it remains clear.

With M Formula you can demand a lot and get it. A strong accurate signal and unsurpassed durability.

With M Formula a perfect balance of oxide to alumina provides the highest signal-to-noise ratio in the industry and lasting durability.

You get a strong, accurate signal that stays that way through more than 15,000 start/stops in Winchester type drives and more than 75,000 head loads in removable media.

Today's drives demand the long standing performance only M Formula is designed to deliver. Our M Formula rigid media products provide data accuracy from the very start and maintain data integrity as time goes on.

Years from now, when you look back at your decision to buy M Formula products, we're sure you will consider it a sound media investment. After all, hindsight always makes things perfectly clear.

To learn more, call your local Memorex distributor or the nearest Memorex district office. Eastern District (212) 541-7780, Southern District (404) 321-0200, Midwestern District (312) 620-3200, Western District (408) 987-2961. Ask for Disc Pack Sales.

MEMOREX
A Burroughs Company

©1982 Memorex Corporation
Memorex is a registered trademark of Memorex Corporation.

Random Notes

Financial Services Provides Treasury Futures Info

NEW YORK — Monchik-Weber Corp. has enhanced its Financial Futures Service to provide analytic information on the 10-year Treasury Futures the Chicago Board of Trade began trading on May 3.

Users of the system now have an interactive simulation capability to test out spreads for likely gain or loss, to analyze possible new coupons and to discern investment opportunities, the vendor explained.

The firm's Financial Futures Service is available through the Tymnet, Inc. and Telerate information time-sharing networks and is priced on an as-used basis. Monchik-Weber is located at 111 John St., New York, N.Y. 10038.

Data Base Directory Out; Organized Alphabetically

WHITE PLAINS, N.Y. — The 1982 edition of *Computer-Readable Databases: A Directory and Data Sourcebook* has recently been released by Knowledge Industry Publications, Inc., for the American Society for Information Science.

The text describes 773 computer-accessible data bases, organized alphabetically by data base name. It is indexed by subject, data base producer, data base processor and name.

The directory is available for $120 from the publisher at 701 Westchester Ave., White Plains, N.Y. 10604.

'Audimate' T/S System Gets Lead Schedule Capability

ANN ARBOR, Mich. — A companion system for automatic lead schedule preparation has been added to Comshare, Inc.'s Audimate, a time-sharing system for certified public accountants.

The new lead schedule capability is said to automate a time-consuming task that requires accountants to record account detail by hand and then manually foot, crossfoot and validate each schedule.

The system is priced per transaction, a spokesman said from 3001 S. State St., Ann Arbor, Mich. 48106.

Two Application Products Released for System/38

MILWAUKEE — Harris Data Service, Inc. has introduced two application software products for the IBM System/38 computer.

They are the A/R and the A/P for accounts receivable and accounts payable applications. Both include source code and user documentation.

Both packages are said to take advantage of the System/38's data base processing and RPG-III programming language capabilities, the vendor said.

The A/R and A/P are available for $4,500 each from Harris Data Service, Inc., 11629 W. Dearbourn Ave., Milwaukee, Wis. 53226.

Business Planning Package Introduced for System/34

EVANSTON, Ill. — System Software Associates, Inc. has announced a business planning and control package for IBM System/34 processors.

The package is an on-line integrated package that consists of 14 application modules designed to give the small and medium-size manufacturer detail planning and control over production and accounting operations, the vendor said.

The basic package costs $3,500 and each module costs $1,000, the vendor said from Suite 600, 500 Davis Center, Evanston, Ill. 60201.

Full-Screen Code Generator Announced For Datamaster

ELK GROVE VILLAGE, Ill. — Dependable Computer Programs, Inc. has announced FSP-GEN, a full-screen processing code generator for IBM's System/23 Datamaster.

The package is said to eliminate screen coding and debugging functions. Users can enter the screen directly on a CRT terminal and it will appear in the application program in the same format, the vendor said.

The package costs $350, the vendor said from 225 N. Arlington Heights Road, Elk Grove Village, Ill. 60007.

Report Writer for Series/1 Gets Data Entry Addition

DALLAS — Enhancements including data entry and query functions have been added to a report writer for the IBM Series/1 line of processors by I-Concepts, Inc.

Assistar-De is a menu-driven product that offers the ability to create or enhance applications, according to the vendor.

This product is priced at $2,500, and I-Concepts is located at Suite 228, 2560 Royal Lane, Dallas, Texas 75229.

Four Integrated Aids Out For Electric Cooperatives

ATLANTA — Southern Engineering Co. of Georgia has announced an integrated series of four software packages designed to assist rural electric cooperatives with financial and operations planning.

The Utility Modeling System (UMS) runs on IBM mainframes under IBM's VS or VM/CMS operating systems. The four packages are said to include production costing, an operating expense, a capital accounting and a financial analysis model.

UMS is currently priced at $174,000 and will be available in approximately eight months, the vendor said. Users can place orders for UMS with Southern Engineering, 1800 Peachtree St. N.W., Atlanta, Ga. 30367.

SIGGRAPH '82

The Premier Computer Graphics Conference

Plan now to attend SIGGRAPH '82, the Ninth Annual Conference on Computer Graphics and Interactive Techniques, July 26-30 in Boston.

SIGGRAPH '82 is a complete technical conference covering every phase of computer graphics. The conference features:

- Exhibits by more than 140 companies displaying the latest graphics hardware, software, peripherals and services
- 24 diversified courses including introductory tutorials and advanced seminars
- Technical sessions featuring the latest in research and innovative applications
- Detailed vendor forum presentations
- Computer-generated film and art shows

The premier national event in computer graphics, SIGGRAPH '82 is the only conference where you can get a well-focused and in-depth perspective on both the present and future directions of this challenging aspect of computer technology.

For registration information, call or write:

SIGGRAPH '82
111 East Wacker Drive
Chicago, Illinois 60601
(312) 644-6610

Sponsored by the Association for Computing Machinery Special Interest Group on Computer Graphics in cooperation with the IEEE Technical Committee on Computer Graphics, Eurographics, Harvard Graphics Week, and the Summer Institute of Media Arts

acm

Micro Notes

Chang Laboratories, Inc. has announced its family of **Microplan** products for financial modeling and what-if analysis to run under any Digital Research, Inc. CP/M version 2.2 or greater or CP/M-86-based 8- or 16-bit microcomputer. The software includes a file compatibility module to translate CP/M or CP/M-86 files created with other application programs to Microplan format. Microplan is priced at $495 with the optional Consolidation Module priced at $295. Chang Laboratories is located at 10228 N. Stelling Road, Cupertino, Calif. 95014.

Westico, Inc. has announced that its **Microgantt** project planning system for the IBM Personal Computer is now available for microcomputers compatible with Digital Research, Inc.'s CP/M operating system. Microgantt costs $395 for the system and documentation, while documentation alone is $25 from the firm at 25 Van Zant St., Norwalk, Conn. 06855.

An intelligent terminal emulator for microcomputers based on Digital Research, Inc.'s CP/M operating system is available from Shared Systems Technologies, Inc. The **Advanced Communications Emulator (ACE)** carries a single-CPU license fee of $150. The firm is located at Rt. 7 S., Box 1073, Bennington, Vt. 05201.

Micro Five Corp.'s Series 3000 computers can now be supported by Microcobol Products, Inc.'s **Mbos/5** operating system, making it possible to run programs written in Cobol or Microcobol on the multiuser Series 3000. The four models of the Series 3000 range in price from $15,400 to $23,300, a spokeswoman said from 17791 Sky Park Circle, Irvine, Calif. 92714.

Apple Computer, Inc. has introduced a financial planning and analysis package and a business graphics package for the Apple II computer. **Apple II Senior Analyst** requires a 48K-byte Apple II or an Apple II Plus with a language card or a memory card. The software costs $225. **Apple II Business Graphics** is said to perform data analyses and transform numerical data into simple illustrations. With the same equipment requirements as the Senior Analyst package, Business Graphics costs $175 from the firm at 20525 Mariani Ave., Cupertino, Calif. 95014.

Aton International, Inc. has added a line of applications software to enhance its **Jobstream CP/M 2.2** (from Digital Research, Inc.) operating system. Jobstream CP/M is currently available on the Radio Shack TRS-80 Model II and Model 16 microcomputers. Two programs, **Basic Surrogate** ($99) and a product called **Visicalc Surrogate** ($99), (which refers to Visicorp's Visicalc), provide the interfaces allowing Radio Shack versions of Basic and Visicalc to operate in the Jobstream CP/M environment. Aton is located at 260 Brooklyn Ave., San Jose, Calif. 95128.

Visicorp has made available an enhanced version of its **Visischedule** software package to run on Apple Computer, Inc's Apple III personal computer. The package provides an on-screen schedule of projects and tasks for increased organizational efficiency The package requires a minimum of 128K bytes of memory and one external disk drive of either a floppy disk drive, Corvus hard disk drive or Apple's Profile hard disk drive, according to the vendor. The package, priced at $300, will be available in July from Visicorp, 2895 Zanker Road, San Jose, Calif. 95134.

Delta Micro Systems, Inc. has introduced **basic'** — which is described as a structured extension of the Basic language. Available for the Apple Computer, Inc. Apple, IBM Personal Computer and Radio Shack TRS-80 machines, the system development package costs $129 from the firm at P.O. Box 15952, New Orleans, La. 70175.

Phillip L. Emerson has introduced a general-purpose communications program for Heath Zenith, Inc. H8, H89 or Z89 computers running under the Hdos Version 2.0 operating system. **Mortty** is said to include Ascii and Baudot code capabilities at any data rate of which the equipment is capable. The package costs $100 from Phillip L. Emerson at 3707 Blanche St., Cleveland Heights, Ohio 44118.

Wolf Software Systems, Inc. has announced a file transfer package for IBM Personal Computers. Called **Move-It**, the package can be used with both the Microsoft Corp. PC-DOS and Digital Research, Inc. CPM/86 operating systems. The package allows the user to transfer files to and from any other IBM Personal Computer running Digital Research Inc.'s CP/M, MP/M or MP/M-86 operating systems. The package costs $150 plus $2 for shipping and handling, the vendor said from 23842 Archwood, St., Canoga Park, Calif. 91307.

Business Software Services has announced a Pascal development tool for Apple Computer, Inc. Apple III microcomputers. Called **Easyform**, the package generates Pascal code that displays programmer-designed screens, gathers data from entry fields on those screens and edits data based on field descriptions specified by the programmer, the vendor said. The package costs $150, the vendor said from 17 Pease St., Wilbraham, Mass. 01095.

Bytek, Inc. has announced **Cogo**:: an Ansi Cobol-74 program generator that can be used on NCR Corp. 8000 and 9000 series minicomputers as well as microcomputers running Digital Research, Inc.'s CP/M, MP/M, CP/M-86, Radio Shack's TRS-DOS, Digital Equipment Corp.'s RT-11, Phase One, Inc.'s Oasis and Bell Laboratories' Unix operating systems. The package costs about $950 for microcomputer users and $3,650 for NCR users, the vendor said from 1714 Solano Ave., Berkeley, Calif. 94707.

ABN Corp. has announced **RL-1**, a relational data base management system for IBM's Personal Computer and other microcomputers based on Digital Research, Inc.'s CP/M operating system. The package includes operators such as selection, projection and join and features a query language relational editor and program interface, the vendor said. The package costs $495 from the vendor through P.O. Box M1047, Ann Arbor, Mich. 48106.

Instrumentation Laboratory, Inc. has announced a **virtual memory implementation** of the Bell Laboratories' Unix System III for systems based around the Motorola Corp. 68000 microprocessor. The configuration uses the firm's Pixel 100/AP microprocessor and costs about $15,000 for a four-terminal system with 40M bytes of Winchester disk storage, the vendor said from One Burtt Road, Andover, Mass. 01810.

The Small Business Systems Group has announced **Version 2.50 of its ST80-III** package for Radio Shack TRS-80 Model I and III microcomputers. The package is a terminal program that includes 27 terminal executive commands and the ability to set runtime parameters, the vendor said. The package costs $150. For users of Version 1 of the program, an upgrade package costs $50, the vendor said from 6 Carlisle Road, Westford, Mass. 01886.

Advanced Operating Systems has announced **Hello Central**, a communications package for Apple Computer, Inc. processors which allows the microcomputers to communicate with mainframes, minicomputers and other microcomputers. The package includes several text handling features, a built-in editor and the ability to manipulate and print text files. Other features include global search/replace and an altered line-length reformatting ability, the vendor said. The package costs $99.95 the vendor said from 450 St. John Road, Michigan City, Ind. 46360.

TODAY'S THE DAY.

FOR GENESYS HUMAN RESOURCE MANAGEMENT SYSTEMS.

Today's the day you can *completely* automate with the most comprehensive, sophisticated Human Resource Management applications software ever available:

GENESYS PAYROLL
GENESYS PERSONNEL
GENESYS BENEFITS MANAGEMENT

Genesys software is custom-generated to meet your company's existing *and* future needs. Modular and open-ended to provide unexcelled versatility and flexibility, with complete security and automatic triggering that forwards entered data across all cross-referenced data bases. Guaranteed to meet all U.S. and Canadian government (ERISA, OSHA, IRS, EEO) requirements — even as they change. Time proven design that responds to personnel administration inquiries, management information requests and government compliance reports. All at the touch of a button, in seconds.

Let Genesys end your Human Resource programming and data retrieval backlog. Today.

Plus...
ALL-SCREEN™
DATA ENTRY AND
INQUIRY SYSTEM

All-Screen™ is everything your Human Resource Department ever wanted in a 100% user-friendly, terminal-oriented interactive data entry and inquiry subsystem with unlimited screen building capability. Genesys CICS-based All-Screen is the *only* system that will support multiple Human Resource programs and automatically integrate *all* employee data. All-Screen eliminates obsoleting turnaround documents and significantly reduces operator training, without sacrificing security.

Genesys. Because your company's employees are its most valuable asset. If your company has over 500 employees, call us. We'll make your day. Today.

Genesys
SOFTWARE SYSTEMS, INC.

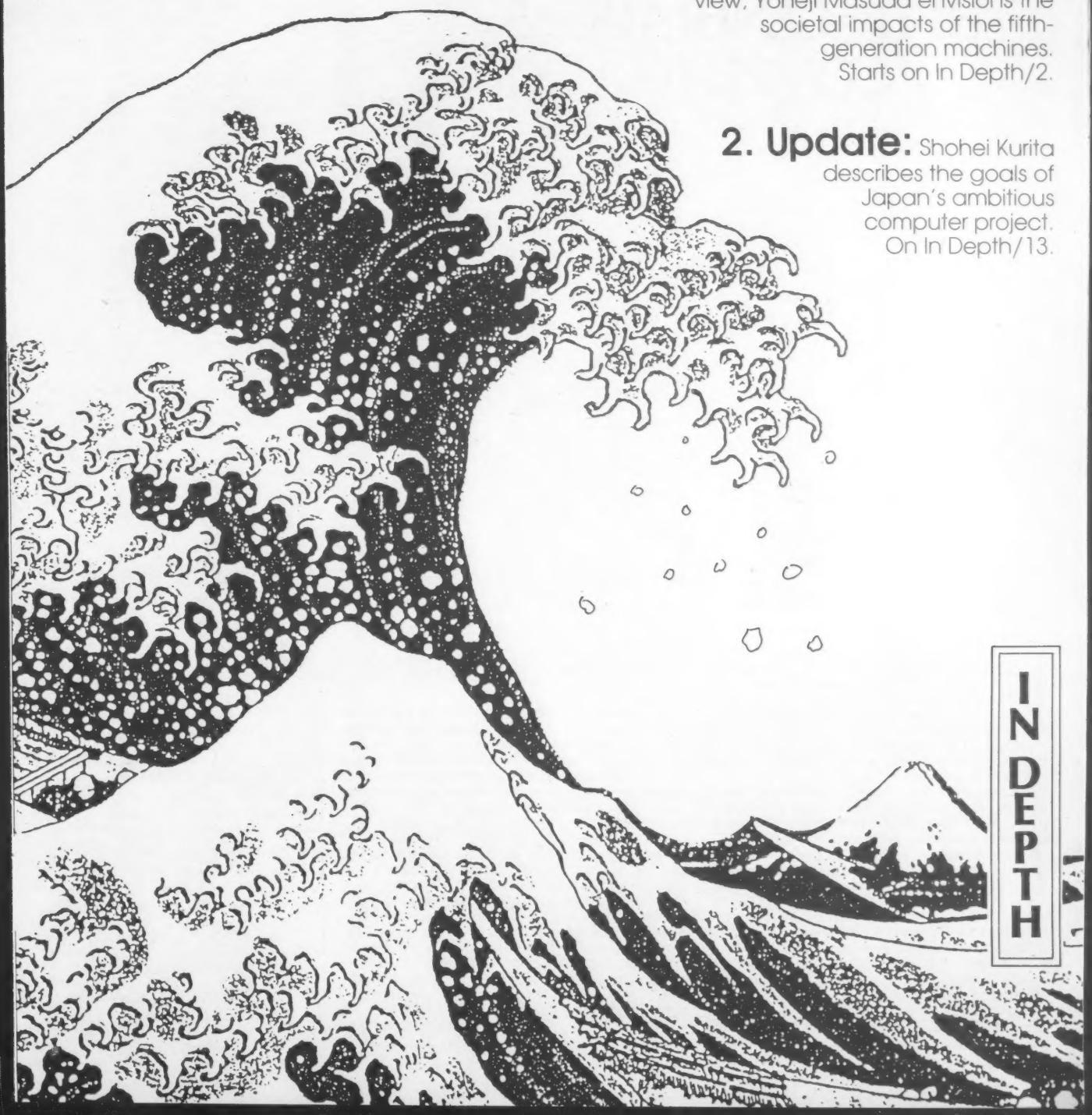
Genesys, 10 Grafton St., Lawrence, MA 01843 AT - 10
Please send me your brochure on these Genesys packages:
☐ Payroll ☐ Personnel ☐ Benefits Management
☐ All-Screen™
Name _____ Title _____
Company _____ Telephone _____
Street _____
City _____ State _____ Zip _____
Hardware _____

JAPAN'S
FIFTH GENERATION

A Special Report on the Coming Tidal Wave From Japan's New-Generation Computers

1. Insight: In an In Depth interview, Yoneji Masuda envisions the societal impacts of the fifth-generation machines. Starts on In Depth/2.

2. Update: Shohei Kurita describes the goals of Japan's ambitious computer project. On In Depth/13.



IN DEPTH

YONEJI MASUDA

TALKS ABOUT THE FIFTH-GENERATION COMPUTER

Yoneji Masuda is an expert on the social and economic impacts of technology and one of the world's leading future thinkers. He is one of the pioneers of Japan's computerization effort and a 20-year veteran of the MIS field, having served as an MIS consultant to both businesses and governments around the world. He is also executive director of the Japan Creativity Society and former chief researcher of the Japan Productivity Center.

He developed "The Plan for an Information Society: Japan's National Goal Toward the Year 2000" in his former position as executive director of the Japan Computer Usage Development Institute, a nonprofit organization. In 1972 the plan was presented to the Japanese government and Masuda was appointed project leader. Masuda went on to found the Institute for the Information Society, based in Tokyo, and serves as its president. (For more information on the plan, see In Depth/10.)

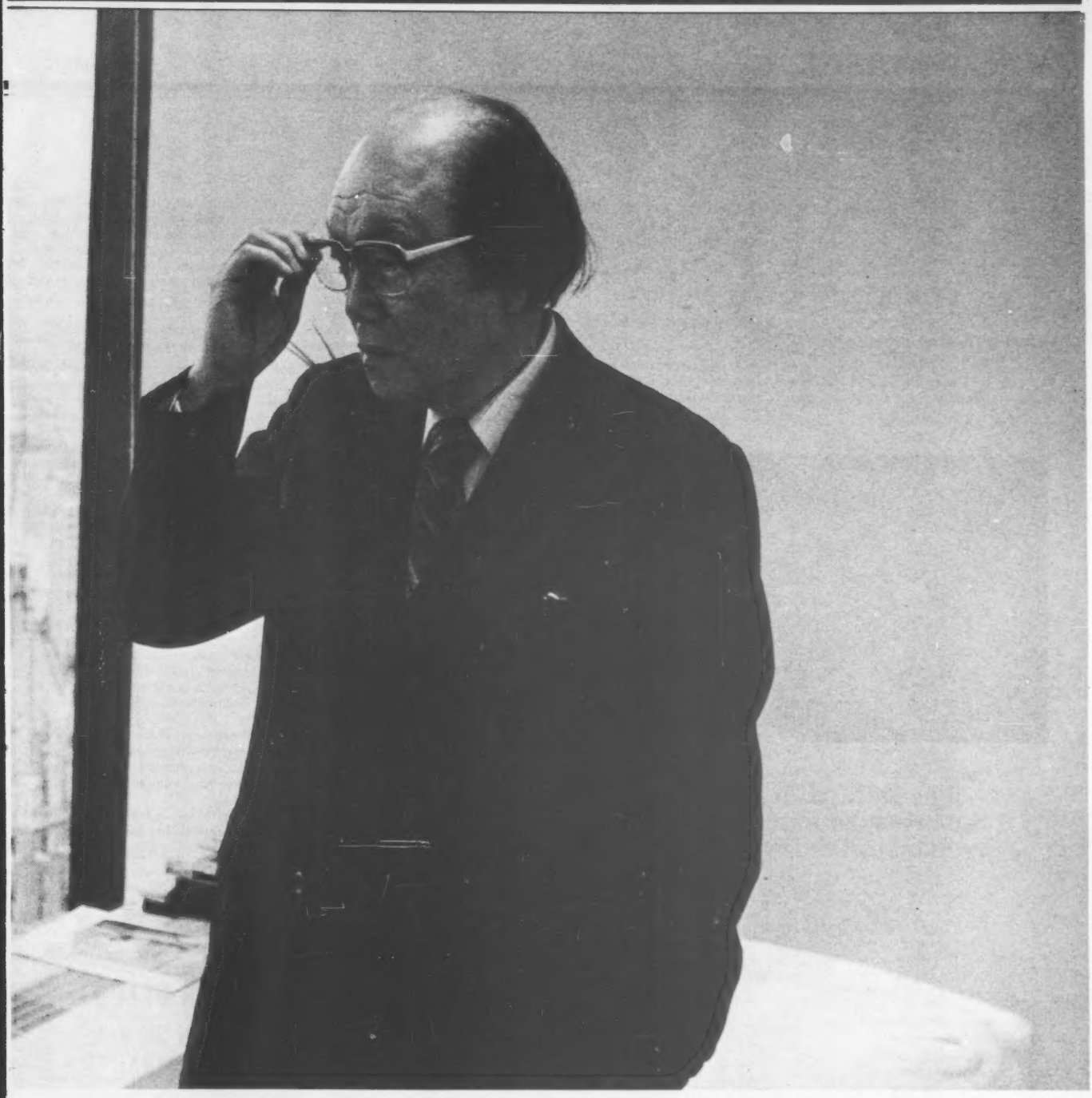
As Masuda puts it, "For 20 years, almost all my concern has been this: What does information mean? What is the value of information? What is the impact of information technology on this society?" He was trained essentially as an economist, but Masuda's studies have crossed the fields of sociology, psychology, education and computer science. Currently a professor of economics at Aomori University, he has also taught at Aichi Industrial University, St. Paul University and Sophia University.

Masuda has written numerous articles and more than 20 books, including *Computopia, Introduction to MIS, The Information Society and Education* and *Information Economics,* which was revised for English publication under the title *The Information Society as Post-Industrial Society,* published in 1981 by the World Future Society, Bethesda, Md. He is also a frequent speaker at conferences around the world.

At the Institute for the Information Society, Masuda is working on two projects: Prime Minister Zenko Suzuki appointed him member of the Social Policy Council, where he is participating in a study project on national life in the future information society. He is also working with the Paris-based World Center for Computer Science and Human Resources, headed by Jean-Jacques Servan-Schreiber, which is sponsoring computerization projects in six countries. Masuda is preparing a report for the World Center on Japan's success in establishing an independent computer industry.

At his son Shigeru's New York office, where the following interview was recently conducted in English, Masuda greeted me personally and graciously apologized for my having to travel to speak with him. Frequently clutching handfuls of Japanese newspaper clippings, Masuda was plainly enthusiastic about the new-generation computer technology — and the information society it will usher in.

— Catherine Marenghi



Design and Photos by D. Mansright

With an investment of $300 million over the next decade, why is Japan so heavily committed to the fifth-generation computer project?

There are three reasons. One reason is that Japan wants to have an independent computer industry. Over the past 15 years we have struggled to catch up to IBM — for government and business, this has been our most important objective in the computer industry.

Now our technology is almost competitive with the IBM machine. And the time has come for Japan to change strategy, not just to follow IBM, but to do better.

To concentrate, then, on original technology, rather than improving on Western technology . . .

Yes, yes, the challenge for the future is to originate technology. The time of catch-up is ending.

The second reason is that Japanese government and business are reconsidering IBM's basic approach. IBM's concept is sequential processing, high-speed computers, plenty of core memory. But this concept will have to reach an upper limit.

At some point there will be no need to make computers any faster or to provide any more memory. There will be a limit to how far we can go with the IBM concept.

What's the alternative?

We should have a *new concept* of computer in the future — a concept to adapt to a dynamically changing environment. This is the second reason for our commitment to the fifth-generation computer.

The third reason is rather an emotional one. Japan has always been a follower in new ideas. Now, as I mentioned, we wish to go ahead of IBM and take some kind of leadership in this field, to contribute to the world. But it is more than that, more than ambition. Rather, it is more intuition, or sentiment — emotion even.

The typical European approach is very scientific. They will set their sights on some distinct technological possibilities and applications and then look at some of the consequences. Always a very analytical, scientific approach. However, the Japanese will sometimes

IN DEPTH

proceed on intuition. We will see very broadly the framework of a possibility, and if we can do that, if our imaginations are sparked, we will start.

These three reasons are why Japan started this project, in my opinion.

What are the most revolutionary aspects of this new concept?

The fifth-generation computers will mimic human recognition systems, just as if they had eyes or ears or noses, or could sense temperature. In this way, they will recognize input in many different forms and produce output that will be easily recognizable to ordinary people.

Do you think that such a machine is feasible?

In this respect — human recognition and sensory perception — the fifth-generation concept is much too ambitious, in my opinion. I don't think we will achieve everything we set out to do.

Other aspects of the new machines are more feasible. They will be self-running systems. They will operate some kinds of factories, controlling a variety of processes. They will recognize many different kinds of results and will determine adequate procedures, based on those results — all by themselves.

There will also be parallel processing systems. Not only one part, but several parts of the factory should be controlled by computers in parallel. By parallel we mean relationships between several kinds of different functions. It's a very complicated processing system.

What about artificial intelligence? What are the most difficult aspects?

The most important is the concept of associative memory, associative functions. This is a most difficult process, because association in memory implies an accumulation of experience and knowledge. Then this kind of accumulation will have some kind of association later on.

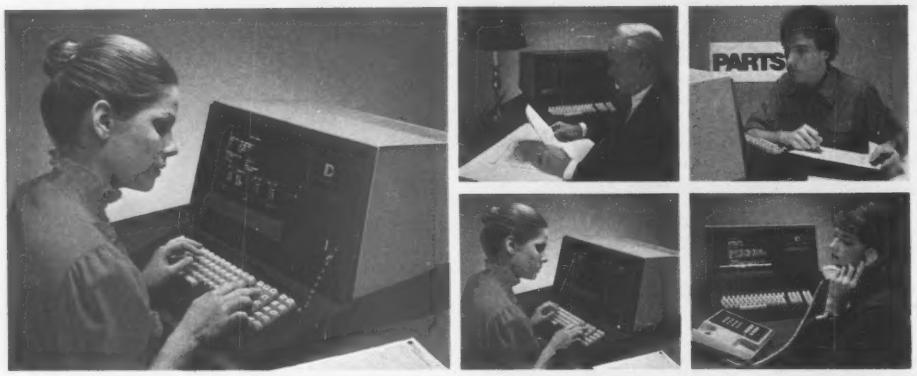
For example, if I climb a mountain and learn the best possible path to take, I will store this experience in my memory. Then, if I meet the same conditions again, I will associate the new conditions with my past experience and determine the best course of action.

The fifth-generation computer should also be able to learn from experience. Associative functions should be provided. These should be most useful in automatic translation, from Japanese to English and so forth.

What you will have is a computer very similar to the human brain. This is the most important aspect of the fifth-generation computers.

Assuming these machines can be built, what will they be used for?

I imagine many kinds of most important applications. As I mentioned earlier, the new machines will be extremely important in factory work. Already we have robots producing



The Datapoint business computer you install today... ...is the start of the integrated electronic office you'll need tomorrow

Get DATASHARE®, the total business data processing system. It's easy to install with multi-user applications available in weeks, not months. And you get transaction processing, interactive inquiry and data entry at headquarters or field locations.

Buy only what you need, and build

Start with a small system like our 1550. You can expand without reprogramming. As your needs increase, simply add more workstations, more storage and printers.

If you've already got a central computer, a communications link lets your DATASHARE system talk to it in the same building or across the country. DATASHARE allows you to build as large a system as you need because all Datapoint® software is upwardly compatible.

And because of Datapoint's ARC™ local network architecture, you can add workstations, increase processing power and extend your database virtually without limit. The DATASHARE system you start with can even grow into our comprehensive information system, the Datapoint Integrated Electronic Office™, which handles word processing, electronic messages and telecommunications as well as data.

Enter a word and find your information fast

Datapoint's Associative Index Method™ is the most significant advance in file access since ISAM.

With AIM™ you can find what you're looking for by entering *any* element that occurs in that file, no matter what field it's in. To find a personnel record, for example, enter the name, the date of hire, the Social Security number, anything. The system will identify every record where that element occurs and display the record on the screen. AIM could save you thousands of hours.

AIM also conserves disk space and makes updating easier because it uses only one index for all keys.

Proven performance and simplicity

Businesses have been using DATASHARE for almost a decade. Now there are close to 30,000 installations worldwide.

We provide a catalog of application software written by users. And when you upgrade your DATASHARE system, you can start using COBOL, BASIC, RPGPLUS, FORTRAN, and other languages.

Service and support

Datapoint's worldwide sales and service organization will help you plan, install and maintain your DATASHARE system.

Datapoint produces information systems that work together now and in the future. We're committed to continually improving existing products and developing new compatible products to meet the needs of business and industry.

If you'd like to know more about the DATASHARE system or about Datapoint, call (512) 699-7059 for the name and number of the Datapoint representative nearest you. Or write to: Datapoint Corporation, Corporate Communications T-41CW, 9725 Datapoint Drive, San Antonio, Texas 78284.

DATAPOINT

SYSTEMS THAT WORK TOGETHER NOW

YOUR VT180 CAN BE A TERMINAL TO VIRTUALLY ANY MAINFRAME

IBM (CMS), DEC Honeywell, CDC DG, H-P, PRIME

WE HAVE AN EMULATOR

Ask for poly-TRM

314/576-7709

polygon associates, inc.
9 American Industrial Dr.
St. Louis, Mo. 63043

robots. In the future we will use all kinds of intelligent robots, not just for assembly or process control, but almost to replace mental labor, even judgment. Especially if fifth-generation computers become very small, they will be excellent in factory robot applications.

Also we shall have very excellent improvements in genetic science. Our understanding of human recognition systems will be an important part of our research into fifth-generation computers. If we can succeed at making this kind of human recognition computer, then genetic science engineering will advance in very significant ways.

I think this new technology will mean a cure to cancer. I envision these new computers linked together in a medical information network, on a global scale. We will have doctors and researchers able to access medical data from all parts of the world.

But the fifth-generation computers can do more than just retrieve data. They can *select* data, make important correlations between different medical findings and aid the doctor or researcher in his conclusions. With such intelligent assistants, the possibilities for medical advances are limitless. A cure to cancer cannot be far away.

How does this fifth-generation technology fit into the future "information society," as you envision it [see introduction]?

Of course, I wrote *The Information Society* before the fifth-generation computer project came into being. But many of the things we are trying to achieve with this new-generation machine mesh well with the kind of society I envisioned.

For example, the information utility — this is a very important concept in my book. By information utility, I mean an information infrastructure consisting of public information processing and service facilities. Anyone, anywhere and at any time will be able to get any information he wants. This will be typical of the information age — information that can be reached easily, quickly and inexpensively by everyone.

You will see the beginnings of this information infrastructure in libraries. Fifth-generation computers will make very excellent librarians, I think, and replace card catalogs with a much more efficient system. Now, when you enter a library, you must know the name of the book or the author to find the book you want. What if you only have an *idea* of what you want? Intelligent fifth-generation computers, in a library system network, will handle even vague requests and be able to make intelligent selections from available offerings of books. These computers will bring a new concept of library.

So far you've suggested that computers will replace librarians and factory workers. How will Japan and other countries cope with the social and economic impacts of the new computers — particularly unemployment?

There will be unemployment, yes. And this will be a serious problem for a while. But there must also be a new approach to work itself.

The first thing to understand is that the information society will be based on different values from the present industrial society, which is characterized by materialism and consumption.

We are at the threshold of a new age, an information age, in which human creativity and intellectual achievements will flourish. New technology, the fifth-generation computer in particular, will make this possible by freeing the individual to pursue his creative interests.

By taking away the burden of traditional labor, the new machines will give us more free time. On the one hand, this means unemployment, yes. But the new age will require a new concept of employment.

Society will have to redistribute jobs, I think. What you will see is a person working one week, not working the next week — alternating with another worker, one week on and one week off. By and by I think you will see workers on half-year shifts, working six months and then

PERQ now comes with FORTRAN, Unix and IBM 3780 Compatibility.

The Processor per Person Machine. Now, more useful than ever.
PERQ® has the processing power and storage capacity to handle virtually any task. *Without* time sharing. And now Three Rivers has made PERQ more versatile than ever. Because now it accepts FORTRAN 77. And the latest Unix operating systems. And it's even IBM 3780 compatible.
Which means even more processing power.
Add these new features to what PERQ already offers. A 32 bit virtual address system. 512K-1MB memory. 24MB of hard disk storage. RS-232 & IEEE-488 interfaces. With a 10MBs Ethernet* local network option. And it's microprogrammable with our optional writable control store.
And even more power at the keyboard.
Along with the new capabilities, the compact, detachable, dependable PERQ keyboard accesses a high performance software package. And it includes a user-friendly operating system, a super pascal compiler system, a what-you-see-is-what-you-get text editor and plenty more.
And even more power with our already very effective display.
Crisp, proportionally spaced, black and white text in a variety of fonts. Together with high resolution graphics. Our display image is also super responsive, receiving data at about 60 mega bits per-second. And interacting through a cursor positioning tablet that's standard equipment.
All of which gives our customers the optimum in high performance workstations.
In applications ranging from publishing to CAD/CAM to research. And others we haven't even thought of. After all, flexibility is one of the main advantages of a complete, high performance single-user machine like this one.

PERQ. The ultimate in distributed computing.

Three Rivers Computer

Three Rivers Computer Corporation
720 Gross Street
Pittsburgh, Pennsylvania 15224
412/621-6250

PERQ is a trademark of Three Rivers Computer Corp.
*Ethernet is a trademark of Xerox Corp.

IN DEPTH

CW Photo by C. Marenghi

free for six. A kind of job sharing.

Our future lives will be structured around free time — not work time.

You are confident that new technology will bring greater freedom for the individual. Isn't the reverse also possible?

This is a most critical point. It is the greatest challenge to human society: how to choose between the inevitable alternatives. On the one hand, the completely automated state, the Orwellian nightmare, repression of individual rights. And on the other hand, fantastic new opportunities for human beings, a completely democratic, harmonious, living society. Both are equally possible.

But you are optimistic.

How to handle stickups

NOW print your own labels, bar codes, forms, etc., with PRINTWARE,™ *the* computerized label printing system from

WALLACE

Your Total Computer Supply and Service Source

The PRINTWARE system, with options as a stand-alone mini or micro computer/printer or as an interface to your mainframe, offers you outstanding flexibility for your label system applications. You can easily create, store, retrieve and print any label format in any quantity that you desire. System capability includes 21 barcodes and OCR-A, character size range from 1/10" to 10". Applications includes shipping labels, warehouse tags, shelf labels, piece rate tickets and more.

Call 312-782-8115 for FREE
PRINTWARE brochure . . . or write:
WALLACE COMPUTER SERVICES/PRINTWARE
4600 W. Roosevelt Rd., Hillside, IL 60162

'What will be the spirit of the times? What will be the concept characterizing the thought of the times in the information society? It will be globalism.'

— Yoneji Masuda
The Information Society as Post-Industrial Society

Yes, yes. I think that if people are made aware of the alternatives, they will make the right choices.

If we apply fifth-generation technology not just in the fields of military defense and space exploration, but also in social applications, also for personal usage, it will provide a fundamental basis for the most democratic of societies.

In the future we should have a new kind of democracy, the information democracy. It will be based on the right of every citizen to know, to utilize information, to participate in government and business decision making. Unlike Industrial Age democracy, the information democracy will be one of direct citizen participation. Videotex technology will play a special role in this participative democracy.

How will videotex contribute to the information democracy?

By providing two-way interactive information services, and interactive participation in government and business decision making. We already have plenty of experience with two-way community information systems in Tama New-Town and Hi-Ovis (see box on In Depth/11). These "computopolis" experiments are finished, and we are now thinking about developing those services commercially.

Japan also has videotex technology called Captains, which corresponds to Canada's Telidon and Sweden's Project Terese. The most critical problem is how to provide flexible software for them. There are very few software offerings now, and they are very expensive. I think the fifth-generation computer will bring many kinds of sophisticated technology, including advances in software development.

When you have ordinary citizens voting and expressing opinions through videotex-type technology, then you will have citizens decreeing their rights over big powers — government and business.

You assume that, given these new freedoms and capabilities, the individual citizen will use them wisely. And unselfishly.

We do not know what the future information society will bring. But making the right choices means we will have to develop social awareness — not only individual, but group awareness. If most people achieve this social awareness toward a rapidly changing environment, it will create a new ethic.

The new technology will require a new ethic. This ethic will be two-dimensional: First, it means greater self-discipline and control; second, it means a responsibility for social contribution.

I hope the fifth-generation computer project will provide leadership and encouragement, not only for technology but also for this new kind of ethic.

Is Japan in a better position to assume leadership of this project than any other country?

We are perhaps the best motivated to assume leadership, for the three reasons that I mentioned. But Japan cannot do it alone. Eight Japanese vendors are participating in the project now. Jipdec [the Japan Information Processing Development Center] is also asking for the participation of other companies from other countries — the U.S. in particular [see box on In Depth/19]. To my knowledge, companies like Sperry Univac, Burroughs and Honeywell in the U.S. and CII-Honeywell Bull in France have expressed interest. Sheer interest — no commitment.

Perhaps by the end of this year it will become more clear which companies will actually join this program. It is hoped that IBM will join, because IBM is a giant, of course, and we hope to gain the benefits of their knowledge.

Also, we are talking about many different kinds of new technology that will go into this project. I believe the whole computer community should contribute, not only for private companies, not only for one country; it will be a contribution to the whole human race.

Now we have a new frontier into the 21st century. It is not the work of Japan alone.

With the current trade barriers between the U.S. and Japan and hostilities among other nations, what could motivate this cooperation?

There remain many kinds of difficult barriers, yes. Initially, profit will be a strong motivator — perhaps the only motive for participation. But I think that when we begin to achieve this fifth-generation capability, when people begin to see the opportunities for human fulfillment, it will provide a fundamental condition for more harmonious and more global thinking.

That's a very fantastic notion, isn't it?

However, this is very fantastic tech-

IBM Management Education.

There's more to management education than going to school.

Look up education in a dictionary and you'll see its definition includes words like "systematic" and "process." In other words, education is not simply sitting in a classroom taking a course. Rather, it's acquiring knowledge with an objective in mind and a planned program to follow. That's why IBM's Information Systems Management Institute (formerly Systems Science Institute) offers five carefully developed curricula to meet the needs of management in today's DP environment. The IS Management Institute, now celebrating its 15th anniversary, has grown from a few offerings to over 30 courses that teach the techniques of managing people and systems.

Their content is continually renewed and updated. The instructors combine years of teaching with practical knowledge gleaned not only from past management experience in IBM, but also skills applied successfully in hundreds of our customer installations. Courses are offered at ISMI's four facilities –Chicago, Dallas, Los Angeles and New York–and other key locations.

Starting below, and continuing on the following two pages, is a brief description of the key courses in each of the five curricula.

To get more information–right now–call toll free 800-631-5582* to hear audio-tape descriptions of each ISMI course. Simply give the operator the names of the courses you'd like to learn more about.

Send us the coupon on the third page for details. You'll also receive ISMI's planning guide, which helps you create the right educational program–tailored to your specific needs–for one person or an entire organization.

The sooner you act, the sooner you can start to improve management skills and the productivity of your DP system.

New Jersey, 800-352-4960. In Alaska/Hawaii, 800-526-2484.

Involve end users from the beginning.

ISMI offers a series of courses of primary interest to end users and the DP professionals who work with them. Most are designed for team attendance by the end user and the DP professional. They cover subjects where increased knowledge will help end users better understand their DP-related activities.

Project planning and control for users (3 days)

Shows users how to become an integral part of the application development process, from requirements and specification phases to the final program. Team attendance with a DP professional is encouraged.

Information Center implementation (2½ days)

Information Centers help shorten the development cycle by providing highly productive tools and applications directly to the end users. This course is for managers responsible for the development and support of end-user facilities and for Information Center DP professionals interfacing with end users.

Planning for office systems (3½ days)

Teaches planning for office systems applications integrated with information processing and communications plans to meet user productivity needs.

Application backlog management (3 days)

Students will be able to more accurately understand the end user's requirements, estimate the scope of the work, determine the business case and assess risk. Helps to assure proper prioritizing of the application backlog based on return on investment and other objectives. Team attendance with DP is suggested.

Disaster recovery planning (2½ days)

This course demonstrates the techniques needed to help identify critical applications and shows how to implement, test and maintain an effective back-up capability before a major disaster strikes the computer facility.

Auditing and controls in data processing (3½ days)

The fundamentals of how to plan and implement an effective DP audit program are demonstrated, including the use of the computer as an audit tool.

Continued on next page ▶

Learn to manage people and systems.

These ISMI courses teach DP managers and potential managers the skills to provide effective leadership with people as well as how to utilize available resources to meet present and long-range information requirements.

Managing data processing (3½ days)

Intended for middle and upper management in the DP organization, this course teaches managerial skills such as long-range planning, team building, goal setting and analyzing big financial issues.

Project management (3½ days)

New managers in project environments learn leadership in project-team activities, how to plan and develop projects, estimate, schedule, measure, and control performance, with emphasis on managing people.

DP operations management (4½ days)

Shows newly appointed and potential operations managers the techniques of effective management within DP operations, working with people to better handle current issues such as security audit, job accounting and charge-back, and work-week alternatives.

Financial strategies for DP executive (3½ days)

Teaches DP executives the financial effects of major DP acquisitions. Concentrates on three key areas: corporate financial considerations, analysis of lease/rent/buy alternatives, and a comprehensive study of types of leases.

Simplify management systems.

This series of courses is aimed at improving the effectiveness of management systems, including those in the systems communications environment. Their primary goal is to increase systems availability, along with the capability to better respond to end-user requirements.

Management control of DP service (3½ days)

This course teaches the essential controls or systems management processes required to effectively manage the DP environment as a business. These processes are described in terms of the logical decisions and activities that must be performed, the data required to make those decisions, the tools, techniques, and organizational alternatives for implementation.

Problem and change management design (3½ days)

Teaches the requirements for detailed design and implementation of problem and change control processes, including the objectives, functions, coordination, data requirements, and reporting and control procedures vital to delivery of DP services.

Disaster recovery planning (2½ days)

This course demonstrates the techniques needed to identify critical applications and shows how to implement, test and maintain an effective back-up capability–before a major disaster strikes the computer facility.

Auditing and controls in data processing (3½ days)

The fundamentals of how to plan and implement an effective DP audit program are demonstrated, including the use of the computer as an audit tool.

Availability planning and management (3½ days)

Designed for strategy and policy setting management. A business executive's approach to high availability I/S service: when it's justified, who's responsible, what's required to obtain and sustain it.

Service level management (3 days)

The process of planning, budgeting and allocating I/S resources to deliver quality computing services to end users. Key focus: enhance end-user productivity.

Data security planning (3 days)

How to select, implement and administer security controls. Identifying exposures, assessing risk and developing cost-effective procedures against the unauthorized destruction, modification or disclosure of data.

Operations analysis and management control (3½ days)

Experienced operations managers and senior staff in a host environment learn the management skills to establish procedures, develop measurements, and plan bypass and recovery techniques to meet user needs.

Managing data communications systems (3½ days)

Focuses on how to establish effective centralized control in the communications network environment. It details the technological, organizational, and managerial solutions for effective network management.

SNA problem determination workshop (9½ days)

A series of hands-on problem-solving exercises in ISMI's specially equipped laboratory. Uses hardware and software tools to interpret network data to isolate problems. Teaches skills to help reduce problem resolution time and improve end-user availability.

Speed up application development.

ISMI offers a series of specific courses designed to attack and reduce the application backlog. They demonstrate successful techniques to plan and control project priorities, to accelerate project development, and to improve project quality and end-user satisfaction.

Accelerating application development (3 days)

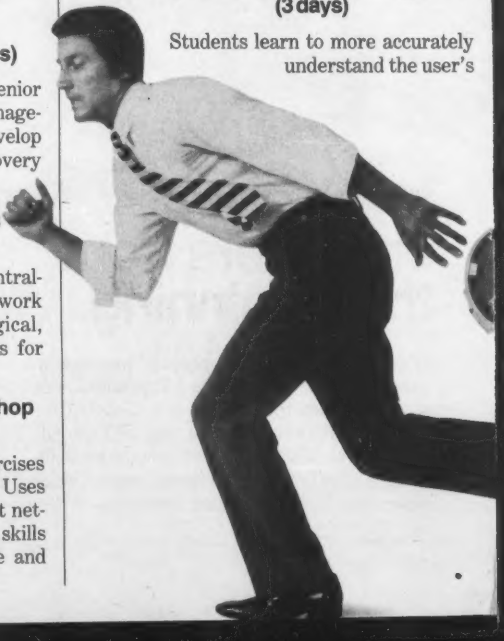
Teaches the tools and techniques needed to improve the quality and rate of application development. The role of proper management in achieving these goals is emphasized.

Project planning and control for users (3 days)

Shows users their role as an integral part of the application development process from requirements and specifications to delivery of the final product. Team attendance with DP professionals is recommended.

Application backlog management (3 days)

Students learn to more accurately understand the user's



requirements, estimate the scope of the job, determine the business case, and assess the risk. Helps to assure proper prioritizing of the application backlog based upon return on investment and other objectives.

Top-down requirements analysis (3 days)

Students learn how to specify systems that meet user needs and how to produce functional specifications that are easy to understand, maintain and implement.

Top-down software design (4½ days)

The use of advanced top-down structural design techniques, in both batch and online environments, to reduce development time and maintenance costs.

Application test and maintenance (4½ days)

How to define and install the policies and techniques that can reduce the cost of test and maintenance procedures, stressing product quality and end-user satisfaction.

Implementing software inspection (3 days)

Learn proven procedures for early detection of errors and inconsistencies in design, code and test plans, with the specific steps required for formal inspections.

Project implementation (4½ days)

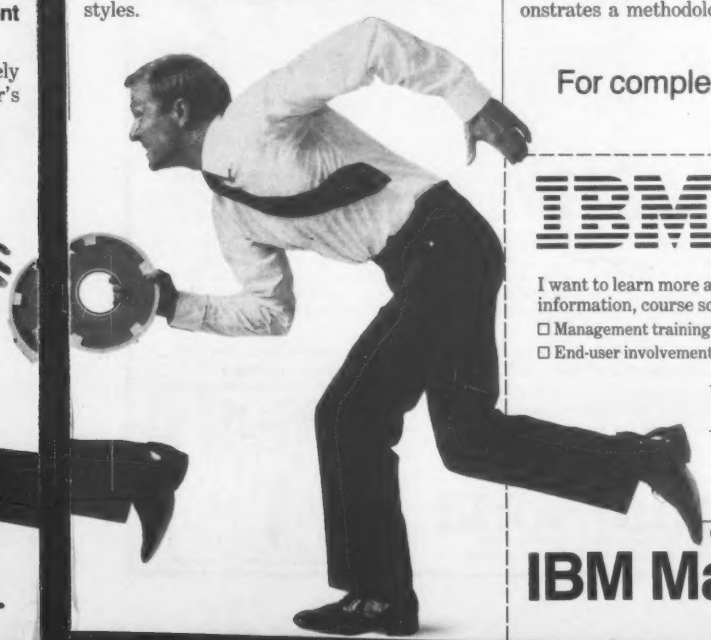
Managers, supervisors, and senior DP staffers are taught to assess, develop, and modify a phased project methodology to help finish projects on time, within budget, while meeting user expectations.

Information Center implementation (2½ days)

Shows how to organize, implement, and promote an Information Center to provide highly productive applications directly to the end user, without the need for a lengthy development cycle.

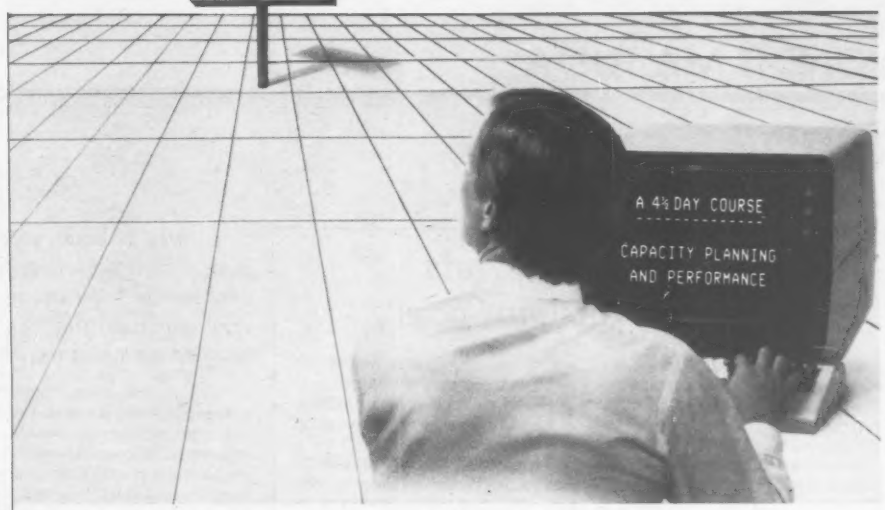
Strategies for solving development problems (3½ days)

Teaches effective strategies for dealing with application development problems. Students develop, evaluate and select solutions to real-life problems and examine their personal styles.



1987

IBM Management Education.



Plan systems that keep on producing.

These ISMI courses teach systems planning methodologies to set long-range goals, schedule activities and measure performance to meet business objectives–without interfering with day-to-day information needs.

Data base administration and design (4½ days)

Presents techniques to design and administer data bases for an integrated shared-data environment. It also explores and defines the organizational impact of such environments.

Availability planning and management (3½ days)

Designed for strategy and policy setting management. A business executive's approach to high availability I/S service: when it's justified, who's responsible, what's required to obtain and sustain it.

Information systems planning (3½ days)

Designed for attendance by DP managers, end users, and top management; this course demonstrates a methodology for successful long-range planning: how to identify needs based upon business priorities, and how to design and maintain a long-range business systems plan.

Capacity planning for managers (3 days)

This course presents the issues and techniques of performance management and capacity planning, together with a methodology for making planning decisions.

Capacity planning and performance (4½ days)

From modeling performance, using queuing formulas, to validation techniques and model refinement, this course teaches the use of tools for critical decisions in capacity planning and performance prediction.

Planning for office systems (3½ days)

Teaches planning for office systems applications integrated with information processing and communications plans to meet user productivity needs.

For complete information mail this coupon today.

CW-6-14

IBM®
Information Systems Management Institute
Post Office Box 2750
Irving, Texas 75061

I want to learn more about planning a complete educational program with ISMI. Please send me information, course schedules and prices for–

☐ Management training ☐ Application development ☐ Systems planning
☐ End-user involvement ☐ Management systems

Name Phone

Title

Company Address

City State Zip

IBM Management Education

IN DEPTH

Drawing Blueprints For an Information Society

The "Plan for an Information Society: A National Goal Toward the Year 2000," well into practical application, sets goals for a model society that are realizable by 1985.

The "Intermediate Impact Plan," which required an investment of $3 million from 1972 to 1977, and a "Long-Term Basic Plan," budgeted for $65 billion from 1972 to 1985, break down as follows:

- **Administration data bank ($300 million):** aimed at controlling Japan's administrative and statistical data.
- **Computopolis plan ($1,169 million):** an experiment in future life in the information society. (More information on the computopolis plan on In Depth/11).
- **Regional medical system ($277 million):** automated hospitals incorporating remote-control care and emergency medical aid.
- **Computer-oriented education ($266 million):** experimental schooling, involving preschool through university students.
- **Pollution prevention ($584 million):** a measuring, warning and control system.
- **Think-tank center ($386 million):** a high-rise building in Tokyo designed to accommodate government and private think tanks, with associated computerized information facilities.
- **Introducing MIS in small businesses ($127 million):** to speed the modernization of small enterprises.
- **Labor redevelopment center ($179 million):** designed to train older citizens for reemployment in technical careers.
- **Computer peace corps ($10 million):** a team of technical specialists and consultants dispatched to developing nations.

Source: The Information Society, *Yoneji Masuda, World Future Society, 1981.*

'As early as kindergarten, students can propose opinions or ideas to their schoolteachers, and if the ideas are approved, they may use the self-running computer to actualize them. This is a very important function of self-running systems: it means an early education in the information democracy.'

nology. In some ways, as I said, it is too ambitious. Sometimes we cannot achieve all that we set out to do. But we have the potential for a new concept of computer. If we can succeed at creating this new concept, we will have achieved much.

Where will it all begin?

If corporations succeed in creating a new kind of robot, this will be a start. Today Matsushita has intelligent robots on the market. Other companies are competing to invent sophisticated intelligent robots, and then this will contribute to the fifth-generation computer project. It will lead to many kinds of advances into associative memory or self-running systems.

Then perhaps at least part of this project will succeed completely. But artificial intelligence is a new and difficult concept. We do not know what kind of logical structures there are in the brain. It will require a very concentrated effort.

In the long-range aspect, this fifth-generation computer project will contribute to human well-being. Because this is a very important concept of computer. Not only control systems, the more complicated field of associative or self-running systems, or the many kinds of sensory recognition, just like the human body — these are not the most important aspects. The new computer will contribute to improved knowledge creation, the development of personal abilities and a change in human attitudes.

You suggest that the new technology will require a change of attitude, or perhaps bring about those changes. How do we overcome resistance to change?

Well, for example, in Japan we have made very big improvements in the field of office automation. Not only top management but also middle managers and clerical workers have begun to use personal computers for decision making.

This is something very new — for people to recognize the computer as a very useful personal tool. If computers were also introduced into the schools, students would recognize the importance of computers and then change their attitudes. And students will introduce computers to their families and change their attitudes, too.

As these kinds of improvements are recognized by ordinary people, by and by we will see a change in their attitudes.

How do you see fifth-generation computers being introduced into schools?

High performance COBOL for PDP-11's

COBOL-PLUS

- Automatic program segmentation runs mainframe programs on PDP-11's
- Self reorganizing multi-key ISAM
- Symbolic interative debugger
- Powerful screen handling
- Shared run time under TSX-PLUS
- Runs under RT-11, TSX and TSX-PLUS

s&h computer systems, inc.

1027 17th Avenue South • Nashville, TN 37212
(615) 327-3670 • twx 810-371-1486

RT-11 and PDP-11 are registered trademarks of Digital Equipment Corporation

Info Savvy

You know the guy. He comes into your store with a solid understanding of what he needs. He asks for specific products and the sale is quickly consummated. He's a regular customer and you enjoy doing business with him.

We know this guy, too—he's our typical reader.

INFOWORLD, THE ONLY MICROCOMPUTER NEWSWEEKLY, WILL INCREASE YOUR STORE TRAFFIC AND EDUCATE YOUR CUSTOMER.

InfoWorld educates and motivates so you don't have to. It raises your customers' level of product awareness and understanding. It generates buying activity. People who read InfoWorld know how fast the market changes, they can anticipate trends and make intelligent buying decisions as a result. They're exposed to information on new products, hardware and software reviews, and overall industry activities, every single week.

Do yourself a favor. Do your customers a favor. Carry InfoWorld, the newsweekly that turns prospects into purchasers. And makes you money. Call today!

Contact InfoWorld's Circulation Marketing Manager at (415) 328-4602 from California, or call toll free, (800) 227-8365 from outside California. Or clip this ad, drop it into an envelope with your business card, and send to:

InfoWorld
The Newsweekly for Microcomputer Users
530 Lytton Ave., Palo Alto, CA 94301.

Fifth-generation computers should be introduced in kindergarten classes. Self-running computers will be very easily accepted by kindergarten children, who will learn to actualize their ideas through computers. They can propose opinions or ideas to their schoolteachers, and if the ideas are approved, they may use the self-running computer to actualize their ideas. This is a very important function of self-running systems: it means an early education in the information democracy.

And, in the future, student will become teacher. Teacher will become student. Because we do not have any experience with self-running systems. Students like these should be given the first opportunity to experience this kind of computer, especially since they are "soft-mannered." They are not afraid of computers. And the computer will provide a very sophisticated society for them.

What about the negative impacts of the new technology? Doesn't this powerful new computer pose serious threats to personal privacy?

The privacy issue will become a very important problem. But if we think only about protection of privacy, that belongs to the more negative attitude toward computers. Of course, we must have more important programs to prevent privacy abuse. However, on the other hand, we should want to contribute our personal data voluntarily into the information utility. When people see the advantages of sharing information to fulfill their personal aims, the privacy issue will lose its meaning.

As an example, I mentioned that the fifth-generation computer will be important in cancer research. Access to personal medical data will be vital in this process. Perhaps there may be no need to provide names and addresses with the personal data — perhaps only the medical experience should be input. It is still personal data, and it might mean privacy invasion. But which is more important — privacy or a cure for cancer?

Who is going to convince ordinary citizens that sharing information is more important than privacy protection?

Government leaders should launch an educational campaign to show

The 'Computopolis' Projects: Visions of the Future

In 1973 the Living Visual Information System Development Association was formed in Japan to unify two "computopolis" projects: Tama New Town and Higashi-Ikoma New Town.

Tama New Town, 30 kilometers from Tokyo, was chosen for an initial experiment from 1975 to 1977. It included 500 households and 11 community information services based on coaxial cable information systems (CCIS). A total of $4 million was spent laying the lines.

The TV-based services included original telecasting, which allowed local residents to participate in preparing telecasts. Other services included facsimile services, allowing newspapers and local stores to transmit news and sale announcements directly to homes, and two-way broadcast and response services.

The Higashi-Ikoma Optical Visual Information System (Hi-Ovis), located in the Nara prefecture, was completed in seven years at a cost of $16 million. It uses optical fiber cable instead of copper cable for two-way multiplex transmission of voice, images and data.

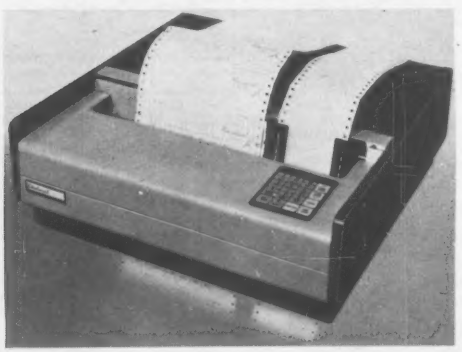
Said to be the world's only optical fiber communications network in practical use, Hi-Ovis initially linked 158 households and 10 public institutions. Its services were similar to those in Tama, but richer in quantity and quality.

Both Tama CCIS and Hi-Ovis are significant, according to Yoneji Masuda, because (1) they serve as an important infrastructure of a future information-based community, and (2) the systems were very effective in enabling local residents, including housewives, to participate more fully in community activities.

Source: The Information Society, *by Yoneji Masuda, World Future Society, 1981.*

Cardinal.
2170

High Speed Dot Matrix Data Printer



O Five paper drive combinations including top or bottom tractor drive and individual forms handler.
O 200 cps.
O 9-pin ballistic print head, 650 million character life.
O Near letter-quality print at 100 cps.
O Heavy-duty industrial design.
O Five-input interfaces available.

Cardinal's new 2170 is a rugged performer, tough enough to take anything a factory environment can dish out... yet sophisticated to the point of engineering genius.

Unlike many of today's data printers, the 2170 is available with bottom tractor feed. This enables an operator to remove a form immediately after the last line is printed.

Self diagnostic and signature analysis are built right into the 2170 too. This makes troubleshooting as simple as flipping a switch.

Write for more information today.

Cardinal. COMPUTER DIVISION

Another of the Cardinal Industries
P. O. Box 151 Webb City, Missouri 64870 U.S.A.
Phone: (417) 673-4631

ATTENTION

Four-Phase Systems Users

JL CONSULTING SERVICES, INC., A National Company Providing Quality Oriented, User Friendly, and Flexible Solutions.

Based Upon our 60 Years of Combined Experience and Four-Phase Internals Training We are Able to Provide Our Customers Optimum System Utilization Based Upon Their Needs and Growth Requirements and Our Systems Knowledge.

Financial • Commercial Loans • Trust Management • Safekeeping • Ticklers • Dividend Record Book

Medical • Preventative Maintenance • Contribution/ Mailing

Manufacturing/ Distribution • Order Entry • Inventory Control • General Ledger • Purchasing • Payroll • Sales Analysis • Financial Analysis

JL CONSULTING SERVICES, INC., Can Additionally Provide Your Organization with Management Consulting, Custom Programming, Contract Programming Support, Contract Program Maintenance & Facilities Management.

JL CONSULTING SERVICES, INC.
8700 Indian Creek Pkwy., Suite 310, Overland Park, Ks. 66210
Contact Our Sales Department at (913) 648-8210

A QUALITY, SOLUTION-ORIENTED COMPANY

that this kind of new technology will benefit human beings — for health care, social applications, to fulfill personal rights. And governments should also begin to use computers themselves — not just for special interest groups or political usage, but for social purposes.

The Japanese government has sponsored this kind of effort through the Japan Computer Usage and Development Institute. This is where the "Plan for the Information Society" began, which was the basis for my founding the Institute for the Information Society. The plan emphasizes social applications, including pollution control, medical information systems and a computer "peace corps" [see box on In Depth/10]. Already we have accomplished much, but much remains to be done.

Of course, it will take a long, long time before widespread social awareness is achieved. We will not see a revolutionary transformation. But it will happen, very steadily, it will happen — because there is no alternative.

Who will be the leaders of this new society? Will computer technicians be a new political force?

Ordinary citizens will be the leaders. Of course, in the future, everyone will be a computer user, everyone will be an "expert." By and by computers will become very cheap and also they will provide very sophisticated software for use by ordinary people. Especially in office automation, educational institutions, personal computing, videotex systems — everyone will use computers in very sophisticated ways.

Right now, in the United States, almost all computer users — scientists, software houses, business users — think only of the technological or business aspects of automation, with the aim of achieving more profits. I hope they will begin to see the more important aspects of social applications and personal computer usage.

What role will you play in creating this change of thinking?

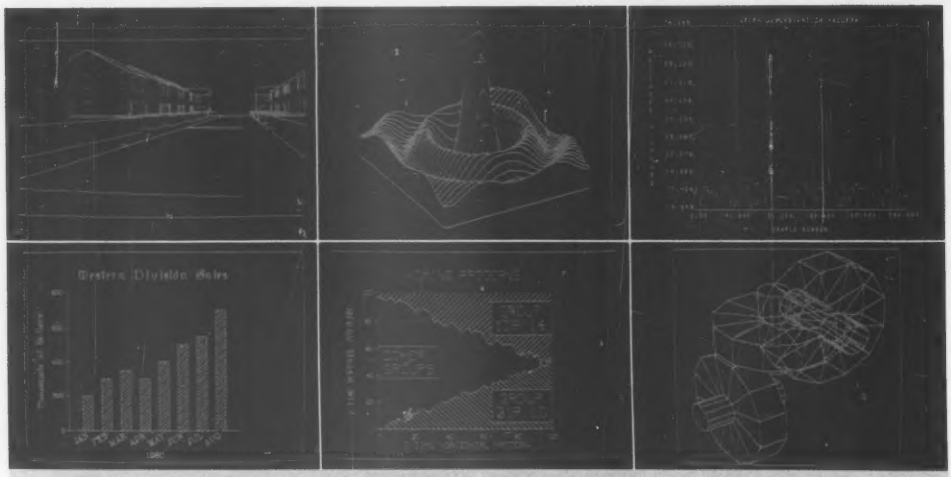
I hope that my book, *The Information Society*, will provide one kind of leadership. Now my philosophy seems very strange. But by and by, almost all people will understand the new way of thinking, and fifth-generation computers will provide a more appropriate environment for people to learn. I think information technology will create the most important societal revolution since the invention of the steam engine. And the fifth-generation computer is much more important than motive power — much more splendid.

I see the fifth-generation computer as a way for the individual to paint on the invisible canvas of his future — and then actualize the design. It will be the basis for a new information democracy, with new possibilities for the individual.

I hope that *Computerworld* will contribute to this kind of thinking.

About the Interviewer

Catherine Marenghi is CW's senior editor, features.



Give your VT100 a new image in 4.4 minutes.

If you have a VT100 terminal, you're just 4.4 minutes away from a high quality, versatile graphics system. At a very low price.

Our SG200 graphics package gives you full Tektronix® 4014 emulation on DEC™ VT100, 103, 105, and 132 terminals. 4010 emulation also is available with our SG100 plus.

But chances are you'll prefer our built-in native mode graphics capability, a powerful tool that makes it easy to program graphics applications. Even if you're not a programmer.

You won't have to give up your regular VT100 capabilities. And our separate graphics memory means you can switch from graphics to standard mode without losing data.

Our features have exceptional drawing power.

There are a lot of other reasons why our retro-fitted graphics are the best choice: Higher X-axis resolution than the competition. Larger addressable plot area, too—65K x 65K dots. The SG200 printer port is totally transparent to the system, so you can print alphanumerics and graphics interchangeably on one printer. Full MACRO capabilities. True area and polygon fill. Arc and circle generation. Cross hair cursor and light pen options. And our easy-to-use software is compatible with many operating systems.

High quality graphics on your LA120.

If you have an LA120 printer, our SG120R board can give it fast raster graphics capabilities. We can also interface with many other popular printers. Including DEC™ LA34 and C. Itoh 8510.

If you want to give your VT100 a new image, call Selanar. We're the experts in high quality, low-cost graphics.

SELANAR GRAPHICS

We're giving terminals a new image.

Selanar Corporation. 437-A Aldo Avenue
Santa Clara, CA 95050 (408) 727-2811

Tektronix® is a registered trademark of Tektronix, Inc. DEC™, VT, and LA are registered trademarks of Digital Equipment Corporation. Selanar Graphics and SG are trademarks of Selanar Corporation.

SAVE TIME & SPACE

Compu-cart

Cut time in computer form change with the only compu cart that combines a 4 box portable form storage with an adjustable paper feed and sturdy shelving.

Deluxe heavy-duty mirror chrome steel, including 4 adjustable shelves to fit behind any printer. 19" W x 17" D x 64" H.

Price $249.00 F.O.B. Factory

UNICUBE corp. a division of Gordon Tube Products Co. Inc.

540 Manida St. Dept. C Bronx, NY 10474
(212) 378-1700

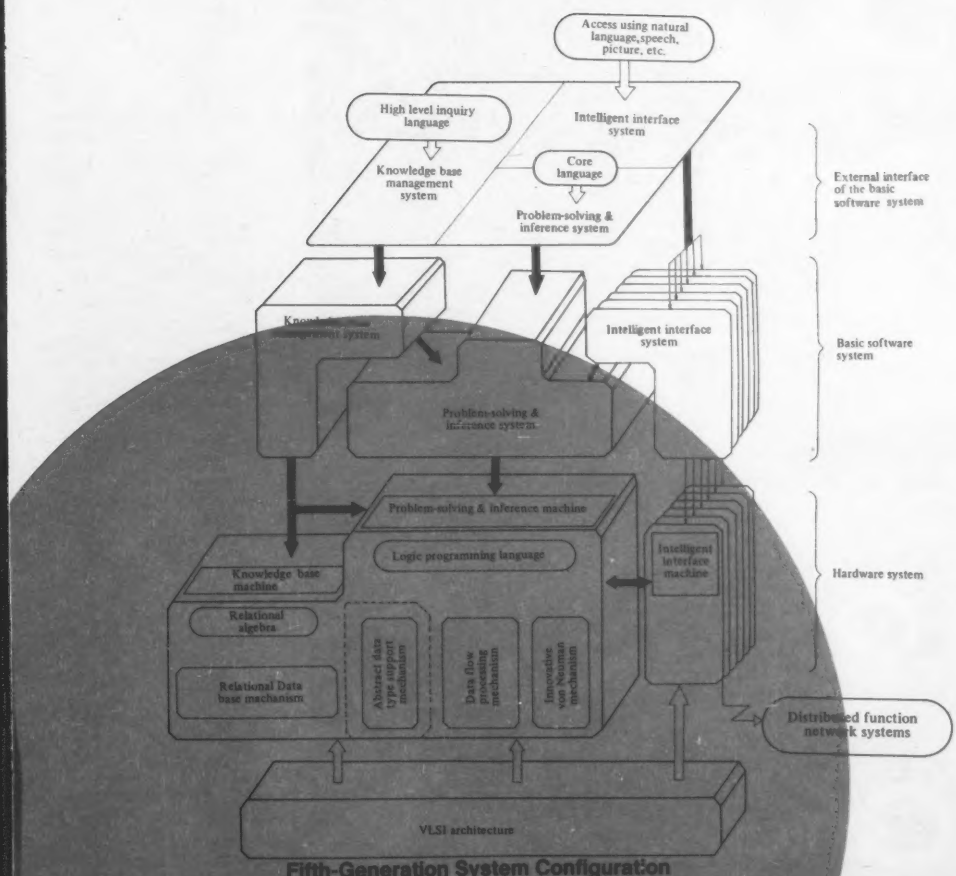
WHAT TO EXPECT FROM THE 5th-GENERATION COMPUTER

BY SHOHEI KURITA

JAPAN IS ENTERING AN AGE OF UNCERtainty. Known for its industrial productivity, the country has a gross national product in excess of $1 trillion, about 10% of the world's total production.

However, several roadblocks threaten Japan's continued prosperity. First, the country is densely populated, with 2.7% of the world's population but only .3% of its total land area. Energy and natural resources are scarce.

Moreover, Japan is an aging society. In this decade its population over the age of 65 will grow four times faster than in most other countries, while its younger labor force diminishes. In this rapidly changing society, there is a special need to develop computers that may be easi-



Fifth-Generation System Configuration

Chart Courtesy of Mitsubishi

IN DEPTH

ly used by laymen, including the aged.

By 1990, Japan will produce about 12% of the world's total goods and services. At the same time, it will be called upon to help control pollution, unemployment and societal misunderstandings. To balance its economic development in the 1990s, to overcome bottlenecks to productivity and to play a leading role in world economic development, Japan will rely heavily on technology — in particular, fifth-generation computer technology.

To this end, the Japan Information Processing and Development Center (Jipdec), under the auspices of the Ministry of International Trade and Industry (Miti), has undertaken an ambitious study project to envision the fifth-generation computer systems of the 1990s and thereby define the goals of research and development in the '80s.

"500,000 Real Estate Transactions Just Months After Installation— That's Reality!"

"The reality of Century 21 Real Estate Corporation's nationwide business was the need for 25 stand-alone computers to handle our half-a-million yearly transactions. So, we selected a Microdata REALITY® computer system for each location, and in months, all 25 were fully operational.

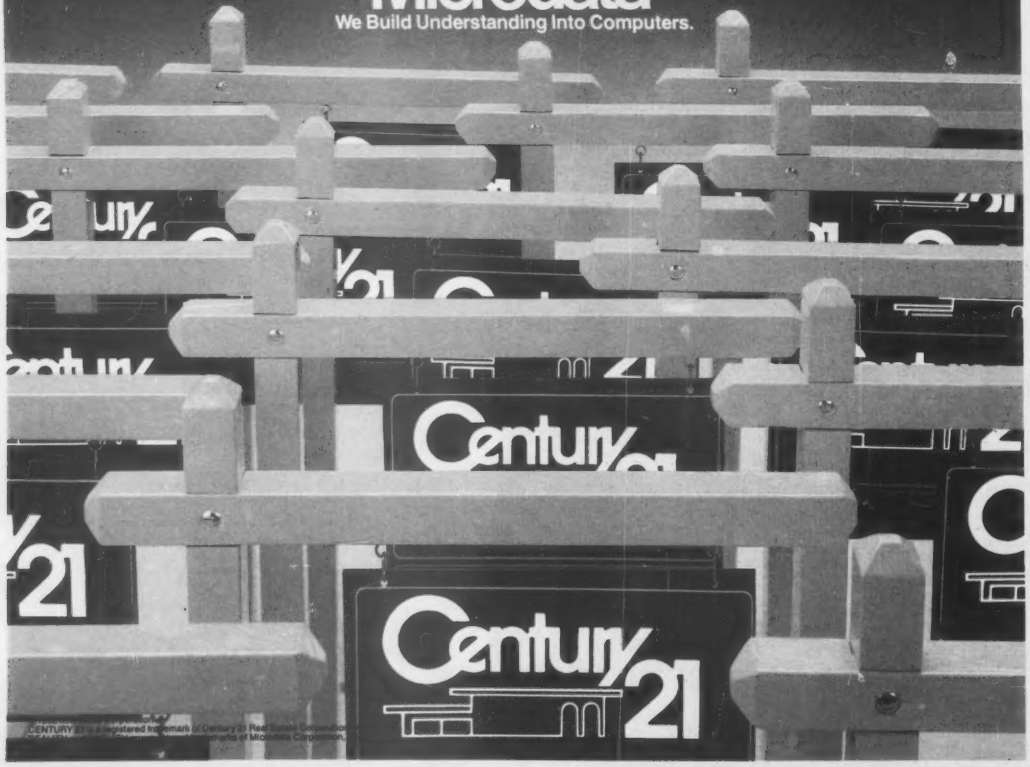
"And not only was the equipment up and running, but also our people. We couldn't believe how quickly they learned to use the system. People with no computer know-how were producing with the REALITY system after just a few days. There was almost no interruption in our work flow."

Why is Microdata's REALITY system the choice of businesses like CENTURY 21? In a word, it's ease of operation. Almost anyone can understand Microdata's ENGLISH® retrieval language. It lets you talk to the system in simple words and phrases. Without scanning through entire files, you can find exactly the data you need, in exactly the format you want it. It's also easy to get service and support. The REALITY computer system is backed by a customer service network that reaches across the country and all around the world. Should you ever have a problem, help is just a phone call away.

No wonder businessmen rate the REALITY system number one in its class year after year. You'll give the REALITY business computer system high marks, too. For complete information and a hands-on demonstration, write Microdata Corporation, P.O. Box 19501, Irvine, CA 92713. Or call toll-free 1-800-821-7700, ext. 122 (except Alaska and Hawaii), or 1-800-892-7655, ext. 122 (in Missouri) for the location of your nearest Microdata representative.

Microdata

We Build Understanding Into Computers.



Roadblocks to Prosperity

Let us review the roadblocks Japan must overcome.

First of all, Japan is contending with low productivity in a number of areas: agriculture, forestry, fishing, public services, clerical work, government services and distribution — all labor-intensive fields. Mr. Hajime Karatsu, managing director of Matsushita Communication Industrial Co. and chairman of the fifth-generation computer project's Subcommittee for Systematization Technology, has pointed out that product prices in the low-productivity fields are rising much faster than prices in the high-productivity, high-technology fields. For example, the price of a haircut has quadrupled from 1970 to 1980, while the price of a 12-inch black-and-white TV has dropped 40%. This imbalance is intolerable.

Second, we are all living in an era of internationalization. The computer and communications revolution is bringing countries closer together. For Japan, this means meeting international competition and contributing to international cooperation. With a shortage of land and natural resources, it is impossible for Japan to be self-sufficient in food and energy.

On the other hand, Japan has one precious asset: a highly educated, diligent and top-quality labor force. Japan's human resources will help offset its disadvantages in natural resources through cultivation of another resource, comparable to food and energy: information. Knowledge-intensive industries will not only help Japan meet international competition, but will also enable it to contribute to international economic development.

A third problem is the energy shortage and the lack of natural resources, not only in Japan but throughout the world. One of the most important tasks facing mankind in this century is how to use our world's finite resources effectively. Computer technology will help minimize and optimize energy consumption, improve the efficiency of energy conversion and provide simulation technology in developing new energy sources. More important, the industrial system it-

self could be expected to change into a knowledge-intensive information industry which would be, by its very nature, non-energy-consuming.

Fourth, as mentioned above, the Japanese are a rapidly aging people because of the low birth rate in a highly educated society. The problem is expected to grow at an unprecedented rate in the coming decade. People above the age of 65 will comprise 12% of the population by 1990. Rapid increases in medical expenses and welfare costs, together with the relative reduction in the younger labor force, could lead to formidable social problems. Accordingly, fifth-generation computers will help Japan cope with such problems and aid the development of streamlined medical information systems, health management systems and lifetime education systems for the aged.

In light of these roadblocks, the social requirements of computers in the 1990s will be as follows: (1) to increase productivity in low-productivity areas, (2) to meet international competition and contribute toward international cooperation, (3) to conserve energy and natural resources and (4) to cope with an aged society.

Technological Foundation

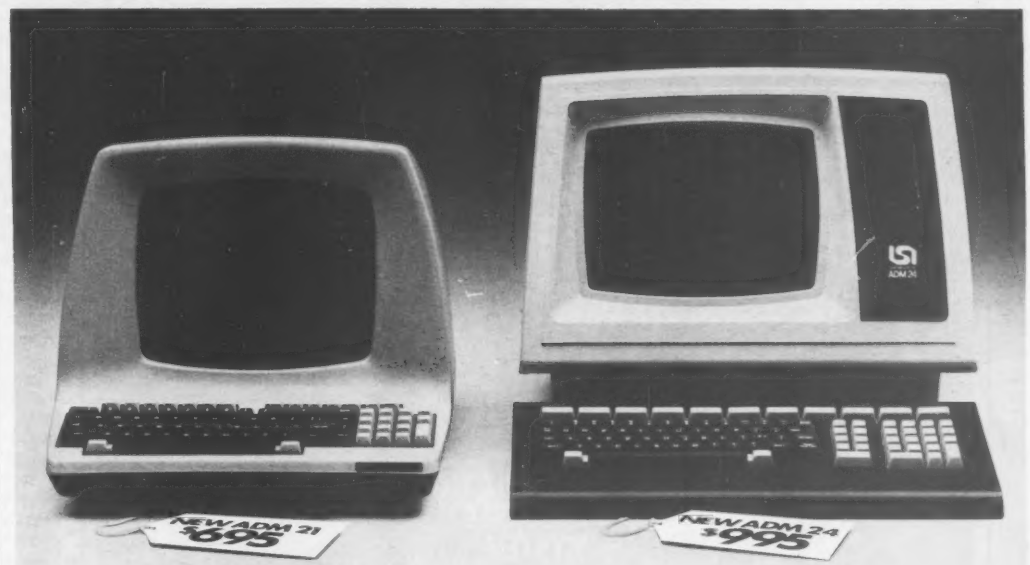
Jipdec's "Preliminary Report on Study and Research on Fifth-Generation Computers" describes the limitations of today's computer systems as follows:

"Computer technology has, from its birth on, consistently and emphatically been aimed at high-speed operation and large capacity and has been developed mainly for processing numerical calculations. As a result, computers have had significantly limited functions in terms of input and output processing that restricted their applications, and this has caused considerable inconvenience.

"As applications for computers have become widespread, from the initial scientific and technical computations to the more recent business data processing, there has arisen a strong need for freer input/output capabilities such as by speech or voice, images, graphics and the like, all of which are natural forms of information transmission for man. The high cost of hardware up to now has not only minimized the number of functions capable of being carried out by it, but has also gradually increased dependence upon software, the proliferation of which has led to a situation called the 'software crisis.'"

An undesirable side effect of this software crisis is that computer architecture, constrained by software, has become inflexible. Computers cannot meet the demands of new applications as long as they continue to rely on existing technologies.

The seeds for the development of new technology, permitting new architectures and new functions, have matured. These include very large-scale integration (VLSI) technology, high-speed device technologies, the integration of computer and communications technologies, parallel-processing technologies, software engi-



What price do you pay for all the bells and whistles on a smart terminal?

Quite honestly, the difference in price is hardly worth mentioning. Especially when you compare the incredible difference in features.

But it's not just the differences between these terminals that are important. It's the similarities, too.

For example, both terminals come from the same company that virtually every industry-conducted survey shows to be the world's favorite independent terminal manufacturer.

Both terminals come from the same company that's the price/performance leader all the way up and down the general purpose CRT terminal scale.

Both terminals come from the company that should always be your first choice in terminals.

OUR ADM 21	OUR ADM 24
CONVERSATIONAL/ BLOCK MODE	OFFERS EVERYTHING THE ADM 21 OFFERS, PLUS:
FULL EDITING	FULL "NON-EMBEDDED" VISUAL ATTRIBUTES
PROTECTED FIELDS	OPTIONAL 48 OR 96 LINE PAGE WITH 24 LINE WINDOW THROUGH MEMORY.
FULL VISUAL ATTRIBUTES	25TH LINE — FUNCTION KEY LEGENDS/MESSAGES/ TERMINAL STATUS/SET-UP
12" MONITOR	8 PROGRAMMABLE FUNCTION KEYS (64 CHARACTERS PER KEY FUNCTION)
8 FUNCTION KEYS	7 BUILT-IN INTERNATIONAL CHARACTER SETS
OPTIONAL INTERNATIONAL CHARACTER SETS	DETACHABLE KEYBOARD
POPULAR TERMINAL EMULATION	SMOOTH OR JUMP SCROLL
	HORIZONTAL SPLIT SCREEN
	LINE DRAWING/WIDE POINT GRAPHICS
	OPTIONAL 6-POSITION TILT MECHANISM
	OPTIONAL 14" MONITOR
	BIDIRECTIONAL AUXILIARY PORT
	KEYBOARD-ACCESSIBLE, NON-VOLATILE SET-UP MODE
	SPACE FOR ADDITIONAL RAM OR ROM
	OPTIONAL 300/1200 BAUD MODEM AND POLLING
	OPTIONAL VECTOR DRAWING GRAPHICS COMPATIBLE WITH TEKTRONIX PLOT 10™

Both terminals come from Lear Siegler.

So while other manufacturers can ride the coattails of our Dumb Terminal™ brand name, and while other manufacturers can copy our famous look, there's one thing they can never take away from us.

The Lear Siegler trademark. And the quality that goes with it.

THE ANSWER IS LEAR SIEGLER. THE QUESTION IS WHICH ONE.

LEAR SIEGLER, INC. DATA PRODUCTS DIVISION

Lear Siegler, Inc./Data Products Division, 714 North Brookhurst Street, Anaheim, CA 92803. 714/774-1010.
Distributor Sales and Service: San Francisco 415/828-6941 • Los Angeles 714/774-1010 X-219 • Chicago 312/279-7710 • Houston 713/780-9440 • Philadelphia 215/245-6080 • Boston 617/456-8228 • England (04867) 80666. **OEM Sales:** San Francisco 415/828-6941 • Los Angeles 213/454-9941 • Chicago 312/279-5250 • Houston 713/780-2585 • Philadelphia 215/245-1520 • Boston 215/245-1520 • England (04867) 80666. *From the states of CT, DE, MA, MD, NJ, NY, RI, VA and W.V. call (800) 523-5253.

IN DEPTH

neering and research into artificial intelligence and pattern recognition.

In short, the problems with today's systems center on the following:

- Numerical operations.
- Sequential control and minimal hardware functions.
- Centralized processing.
- Software costs.

Profile of Fifth Generation

According to the Jipdec's preliminary report, the functions to be required of fifth-generation computer systems will be as follows:

- Increased intelligence and ease of use.
- Functions that enable input and output via speech or voice, graphics, images and documents. Enhancement of I/O functions that serve as the man-machine interface is of prime importance in making computers easier to use.
- The ability to process information conversationally using everyday language. As computers penetrate further and further into every field of our society, this natural language capability will open up more opportunities for laymen to gain direct access to needed information.
- The ability to put stored knowledge to practical use. In order to use computers more effectively as problem-solving tools, we will equip them with specialized knowledge, or knowledge bases, related to the fields in which they are employed. By putting these knowledge bases to practical use through improved artificial intelligence, computers will be better able to lighten the burden on their human operators as well as serve a consultant role.
- The functions of learning, associating and inferring. With such abilities, computers would be able to clarify even vague requests. Using their vast ability to store information and with new judgment facilities of their own, they could help expand the capabilities of humans as well.

Ease of Use

Fifth-generation computers should provide a friendly man-machine interface, sophisticated functions and performance, artificial intelligence and an advanced data base and communications network. Their functions should meet the following five requirements:

First of all, they must provide functions that are easy to use even without professional knowledge. For example, these functions should be able to process multiple input media and natural languages. They should have "common sense" or, in some cases, expertise.

Second, they must support human beings in their judgment or decision making.

Third, they must be capable of flexible configurations applicable to a wide range of jobs.

Fourth, they must, to some extent, be capable of automatic programming and program revision, or facilitate programming without the need for written commands.

And finally, they must provide reliability and good cost/performance, with automatic debugging and recovery from failures, while at the same time providing sufficient information security. They should be usable at any time, anywhere.

In such systems, new technologies and non-Von Neumann machines will support the functions above mentioned, combined with existing technologies still under development.

Basic Configuration

The fifth-generation computer systems should be developed at all levels, from small- to large-scale machines, in order to process diversified applications. The machines of all performance levels must have common languages as well as the following three basic functions (the remarks in parentheses indicate the correspondence with conventional computer systems):

1. Problem-solving and inference machine (central processing unit). This machine will target a maximum performance of 100M to 1G logical inferences per second (Lips). One inference operation on a present-day computer is said to require 100 to 1,000 steps; hence, 1 Lips is equivalent to 100 to 1,000 instructions per second. Present-generation computers are capable of 10^4 to 10^5 Lips.

Announcing The Payroll/Personnel System for the 80's and Beyond...

For ***ten years*** ISI has been quietly and successfully installing The Payroll/Personnel System. Today, your organization can benefit from our years of experience and specialization in the most modern human resource management system available.

ISI's Client Services staff has worked closely with hundreds of private and public sector clients, ranging from multinational corporations with 180,000 employees to small colleges with 250 employees.

The Payroll/Personnel System includes data base management and complete on-line interactive capabilities and serves such diverse functions as: ***Affirmative Action, Staff Planning and Training, Benefits Administration, Labor Relations, Employment, and Payroll.***

ISI's operating principles are Outstanding Client Services, Quality Products, and Business Integrity. Our continual commitment to these operating principles will ensure that your organization meets its information challenges in the 80's and Beyond...

Further information about The Payroll/Personnel System, including detailed descriptions of each of our products, is available by contacting:

INTEGRAL SYSTEMS, INC.

CORPORATE HEADQUARTERS: • 45 QUAIL COURT • WALNUT CREEK, CALIFORNIA 94596 • (415) 939-3900

REGIONAL OFFICES • ATLANTA, GEORGIA • CHICAGO, ILLINOIS • FLEMINGTON, NEW JERSEY • HOUSTON, TEXAS • TORONTO, CANADA • WALNUT CREEK, CALIFORNIA

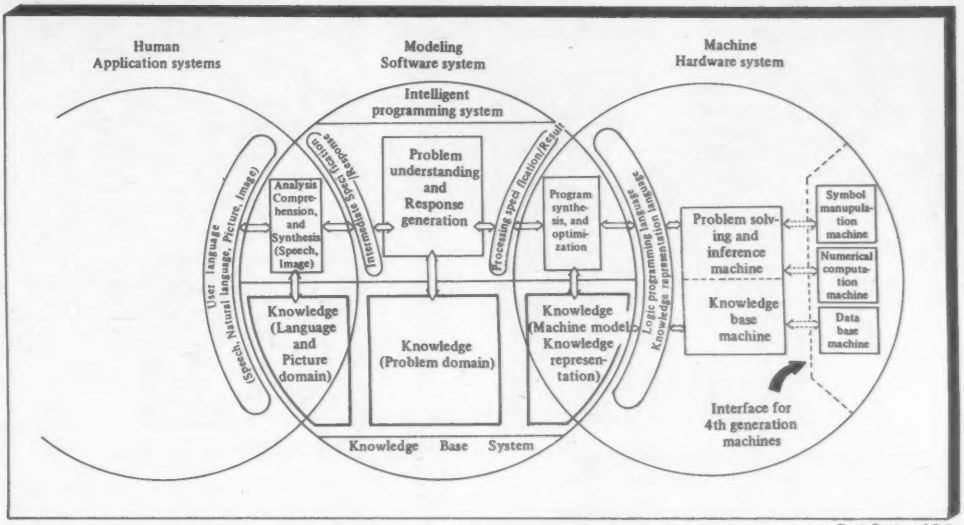
2. Knowledge-base machine (main memory with virtual memory facilities and file system). The core data base machine will have a maximum capacity of 100G to 1,000G bytes.

3. Intelligent interface machine (I/O channels and I/O devices).

It must be emphasized that there will be more than one fifth-generation system. Those computer vendors who are participating in the Jipdec project (eight Japanese vendors are participating to date) will each develop their own version. The new systems will come in a number of sizes and configurations and meet a variety of applications. Their common aims are the following: ease of use, ability to process nondeterministic jobs, high intelligence, superspeed CPU and connection to giant data bases.

There will also be machines of several performance levels within each of these small to large systems to permit flexible configurations according to application or function. The diagram on In Depth/13 shows a fifth-generation system configuration. The machines are to be structured according to function on various new architectures — including a data flow machine — which are based on VLSI architecture, and each system is to be a combination of machines suitable for various individual applications or needs.

Furthermore, from a macro perspective, large-scale distributed processing systems, in which the system shown in the figure might serve as one of the principal elements of a local or global network, are also being considered and researched.



Charts Courtesy of Jipdec

Figure 1. Conceptual Diagram of Fifth-Generation Computer Systems

Knowledge System

Fifth-generation computer systems will be knowledge processing systems with problem-solving functions of a very high level. In these systems, artificial intelligence will be greatly improved to approach the intelligence of a human being, and, when compared with conventional systems, the man-machine interface will more closely parallel the human system.

Figure 1 shows a conceptual diagram of the fifth-generation computer system. As shown in the figure, a powerful problem-solving mechanism based on problem understanding and inference functions, knowledge bases and so forth is located between the human system and the conventional machine functions.

The following functions will be integrated capabilities:

- Understanding problem description and requirement specifications.
- Synthesizing processing procedures.
- Optimization between machine system and processing procedures.
- Synthesizing response based on outputs from machine systems.
- Intelligent interface functions capable of understanding speech, images, natural language and so on.

The knowledge bases that support these functions will contain the following:

- Knowledge of the languages to be used for man-machine communication.
- Knowledge of problem areas to be solved.
- Knowledge of machine systems.

Constituent Software

Figure 2 shows the software system configuration. The elements and their functions are as follows:

(1) Basic software system. The basic software system consists of the three subsystems — problem-solving and inference, knowledge-base management and intelligent interface — which are the basic functions of the fifth generation.

(2) Intelligent systemization support system. The system provides the human designer intelligent functions to support systematization work based on the knowledge base contents. It consists of three subsystems: intelligent programming, knowledge base designing and intelligent VLSI designing.

(3) Intelligent utility system. This

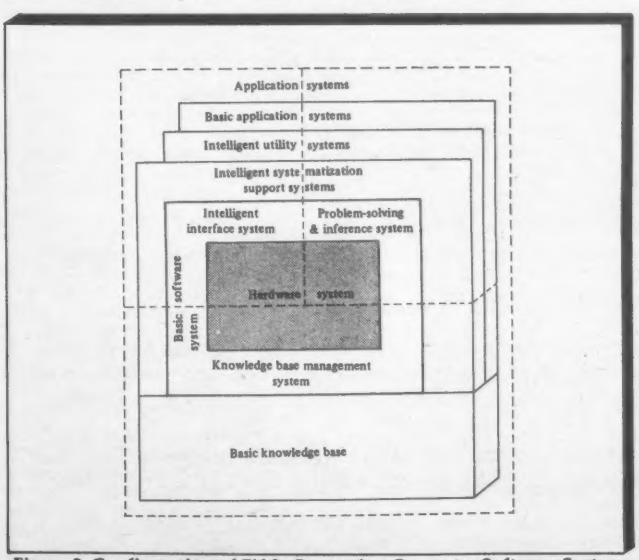
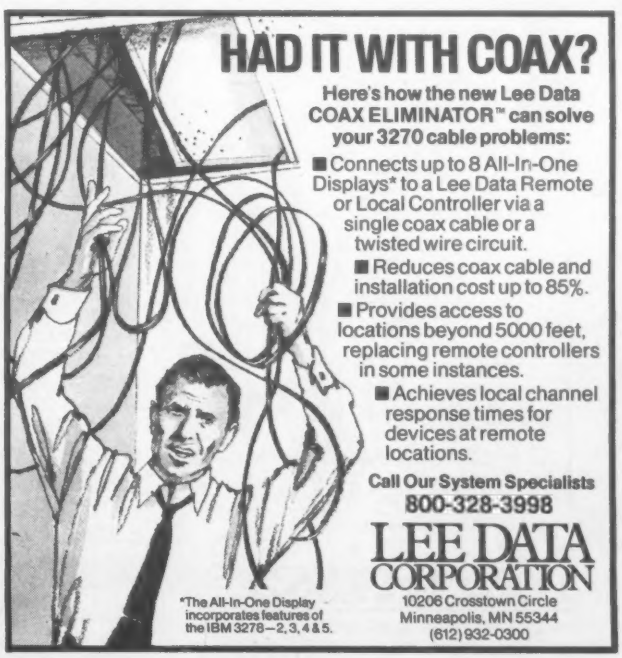


Figure 2. Configuration of Fifth-Generation Computer Software System



IN DEPTH

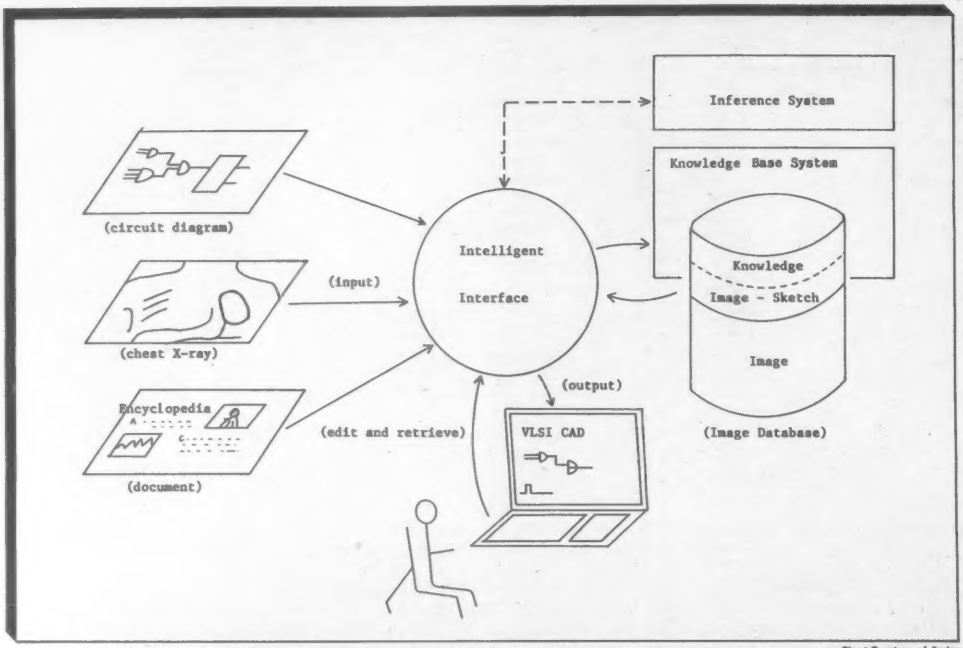


Figure 3. Concept of Pictorial Functions at Intelligent Interface

Chart Courtesy of Jipdec

system's functions allow easy use of the entire computer system and make it highly reliable. The utility system includes programs to support the portability of software and data base from other machines, user guidance functions and automatic inspection and repair functions for preventing and detecting failures.

(4) Basic knowledge base. The basic knowledge base supports the operation of the system itself in addition to containing the accumulated valid and universal knowledge necessary to the user. Generally, there are three types: the general knowledge base that mainly relates to the understanding of natural languages, the system knowledge base related to the system itself and the applied knowledge base containing specialized knowledge for various applications.

(5) Basic application system. The following types of basic application systems can be cited:

- Machine translation system.
- Question-answering system.
- Applied speech understanding system.
- Applied picture and image understanding system.
- Applied problem-solving system.

(6) Application systems. The fol-

BREAKTHROUGH!

REPORT DISTRIBUTION PROBLEMS have been around so long that their final demise is almost like loosing an OLD FRIEND.

CALL (205) 945-8930

LEARN HOW TO PUT THE OLD BOY OUT OF HIS MISERY UNDER DOS/VS, DOS/VSE, AND MVS.

Seminar Schedule

June	City
7	Cleveland
8	Pittsburgh
14	Philadelphia
15	Boston
16	Hartford
22	Houston
24	Dallas
29	Chicago
30	Minneapolis

Mantissa
REPORT MANAGEMENT SYSTEMS

RDS™ puts it all together

Never have so many report segments for so many endpoints been placed in so few bundles for your distribution staff to handle. The result is a dramatic reduction in the manual labor associated with the distribution process (up to 90%) and an equally impressive reduction in error rates and reruns due to misrouted and lost reports.

RDS's ability to consolidate report data by distribution endpoint shouldn't overshadow its other qualities:

- Application transparent
- Control Statement driven
- Eliminates distribution-related programming changes
- Manifest Report by endpoint shows all reports distributed, page counts, line counts
- Global manifest shows all reports distributed
- Unique separator page and message data for each endpoint
- Unique class, disposition, form, and remote destination attributes assignment by endpoint
- No changes in either the operating or spooling system

RDS takes a unique "hands off the application" approach to solving the problem of distributing report data. Using your definition of your distribution requirements and a distribution key that you design, RDS uses your IBM system to distribute your report data.

If you want more details or would like to reserve space at one of our free seminars — give us a call. LOOSING AN OLD FRIEND ISN'T ALL THAT BAD.

244 GOODWIN CREST DRIVE • SUITE 200 • BIRMINGHAM, AL 35209
EUROPEAN REPRESENTATIVE — NAMIC, AS 2545 SOLLI
N-OSLO 2, NORWAY PH (47-2) 56-55-70 • TELEX - 17378

Planners of the Next Generation

The Japan Information Processing Development Center is a nonprofit organization established in 1967 with the support of government and related industries.

When Miti conceived its ambitious Fifth-Generation Computer Development Project, it initiated a two-year study phase from 1979-80 and established the Committee for Study and Research on Fifth-Generation Computers under Jipdec. The committee's purpose was to identify critical areas of technical R&D, to formulate development policy and plans and carry out fundamental studies for the establishment of organizations and systems required for developing the new technology.

Jipdec's work includes surveys, R&D, consulting, education, public relations and international exchange.

Its publications include the *Jipdec Report*, published quarterly in English, and the annual "Computer White Paper" in Japanese and English, covering computing trends and developments in Japan and the rest of world.

More information on the organization and its work may be obtained from Jipdec, 5-8, Shibakoen 3-chome, Minato-Ku, Tokyo, 105 Japan.

lowing systems can be thought of as examples of knowledge information processing application systems:

- Intelligent computer-aided design (CAD) system.
- Intelligent computer-aided instruction (CAI) system.
- Intelligent office automation system.
- Intelligent robot.

Intelligent Interface

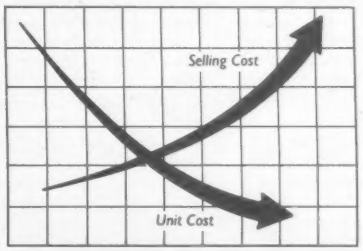
According to Mr. Hozumi Tanaka of the Miti's Electrotechnical Laboratory, the following techniques may be required to realize an intelligent man-machine interface with the function of picture and image processing as shown in Figure 3.

- Intelligent input — the ability to input pictorial and/or image data at high speeds with intelligent control.
- Image-sketch-relation conversion — the ability to extract features (shape, geometric, gray level, texture and so on) and structures (spatial relationships) as sketches from images. These sketches are represented in symbolic form and stored in a relational knowledge base.
- Efficient image storage — the ability to compress the original two-dimensional data to efficient codes if necessary for images that cannot be converted into sketches. Otherwise, these images are stored in two-dimensional form in a high-speed image data base machine.
- Flexible data manipulation — the ability to manage the above two data bases by operations of insertion, deletion and replacement. These editing operations may be performed interactively at an easy-to-use console. In addition, special image operators should be prepared for constructed sketches and images. Images in the data base can be retrieved by giving examples and calculating similarities. These query examples are provided in a string of symbols and/or by the pictorial form.
- Intelligent data output — the ability to reconstruct images from sketches and from compressed data in the display console. Here we need a display mechanism to look at a local area in detail as well as to monitor a global outline of a given larger image. In addition, hard copies are to be generated with high resolution in an attractive color format.
- High-level control. The ability to control the above primitive functions by high-level control languages, image representation and de-

HALT...RESET

MARKETING PRODUCTIVITY IS THREATENED.

As your products decline in price... and your cost to sell rises. As your products become more sophisticated... and your prospects increase... You need *"real-time interaction, with real-time buyers."* You need a permanent market place.



MEETING THE MARKETING CHALLENGE.

Helping you meet this challenge — The Dallas Market Center – with over thirty years experience in bringing buyers and sellers together – provides you a new facility — The INFOMART.

The INFOMART... *The International Information Processing Market Center*... is a medium

designed to meet today's marketing challenges. We envelope the economies of scale to help you improve productivity and maintain organizational profits. We will host and sponsor frequent on-site trade shows and seminars. We will execute concentrated media campaigns promoting The INFOMART with our full-time staff of public relations and advertising specialists.

Plan today to explore this new marketing technique to reach, educate and service your prospects and customers... For your detailed plans on our concept and what we can do for you contact:

Bill Winsor
INFOMART
Dallas Market Center
2100 Stemmons Freeway
Dallas, Texas 75207
214-655-6235

INFOMART

DALLAS MARKET CENTER

IN DEPTH

Software Designed Exclusively For IBM System/38

PRISMS™ software is the ideal ready-to-run order entry and inventory control system for distribution and manufacturing operations.

Designed exclusively for IBM's System/38, it is proven, on-line, "*native-mode*," interactive software which eliminates conversion worries and delivers the 38's full potential.

PRISMS™ gives you the full spectrum of key functions in one powerful, easy-to-use package: Order Processing, Inventory Control, Accounts Receivable, Purchasing/Receiving, Accounts Payable, Sales Analysis and Mail Order operations.

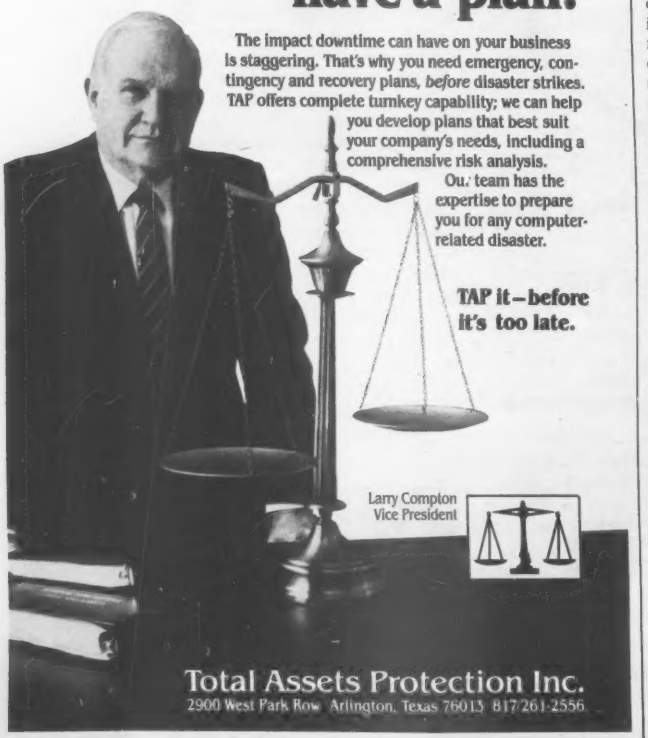
Call or write today. We'll respond immediately. The sooner you install PRISMS™, the sooner your System/38 will deliver the goods.

Softmatics Corporation, 44 Mall Road, Burlington, MA 01803, Telephone (617)273-3420.

PRISMS™ is a trademark of Computer Associates International, Inc

SOFTMATICS CORPORATION

Don't wait for disaster to strike before you have a plan.



The impact downtime can have on your business is staggering. That's why you need emergency, contingency and recovery plans, *before* disaster strikes. TAP offers complete turnkey capability; we can help you develop plans that best suit your company's needs, including a comprehensive risk analysis.

Our team has the expertise to prepare you for any computer-related disaster.

TAP it – before it's too late.

Larry Compton
Vice President

Total Assets Protection Inc.
2900 West Park Row Arlington, Texas 76013 817/261-2556

Basic application systems	Machine translation system Question-answering system Applied speech-understanding system Applied picture- and image-understanding system Applied problem-solving system
Basic software systems	Knowledge base management system Problem-solving and inference system Intelligent interface system
New advanced architecture	Logic programming machine Functional machine Relational algebra machine Abstract data type support machine Data flow machine Innovative von Neumann machine
Distributed function architecture	Distributed function architecture Network architecture Data base machine High-speed numerical computation machine High-level man-machine communications system
VLSI technology	VLSI architecture Intelligent VLSI CAD system
Systematization technology	Intelligent programming system Knowledge base design system Systematization technology for computer architecture Data base and distributed data base system
Development-supporting technology	Development support system

Source: Jipdec

Table 1. Themes in Fifth-Generation Research and Development

scription of manipulation procedure. High-level protocols to the inference engine and knowledge base system are defined as an intelligent interface.

Fifth-Generation Expectations

Fifth-generation computers will be as abundant as air in the 1990s, and ordinary people will access and use information as naturally as air. "The new machine may be put into our daily work quite naturally," Matsushita's Mr. Karatsu says. "Today's computer does not tolerate a single error. On the other hand, fifth-generation computers should work correctly following orders written in ambiguous natural language. This will mean the popularization of the computer."

In manufacturing, intelligent robots will be highly productive, operating in dangerous environments and freeing human laborers from dull and repetitive tasks.

Computers will open or create new markets, such as shopping via home terminals or selling or exchanging information among data banks, data bases and information utilities. The next-generation computers will stimulate the advent of a multichannel society in which individuals can select products from a wide variety of sources. This multiple choice can be achieved without raising prices.

In the medical information processing field, various applications are being studied: hospital general administration, clinical information processing, direct patient monitoring, physiological modeling, medical records, medical statistics, patient counseling and diagnostic aid. The knowledge-based fifth-generation computers will play important roles in this field.

In education, user-friendly computers connected to CAI curriculum data bases or spatial data management systems will stimulate a revolution in teaching. They will ease the problem of student dropouts and give individuals the opportunity to study or learn at their own pace, anytime and anywhere they wish.

Government and public industries will experience improved productivity as a result of fifth-generation computers. The systems will help smooth their heavy information processing burden and ease the internationalization process.

The social needs of the '90s will define the direction of the fifth-generation computer. When these new systems are widely used by laymen, they will impact the social structure and human life-styles.

Office Automation

Jipdec's study of office automation concepts, conducted in 1980, uncovered an overwhelming need in Japan for these technologies.

In terms of applications, there is a great demand for image processing, including manual preparation in conjunction with charts, pictures and written statements; blueprint storage and retrieval; and preparation of specifications, proposals, reports and so forth from large corporate data bases.

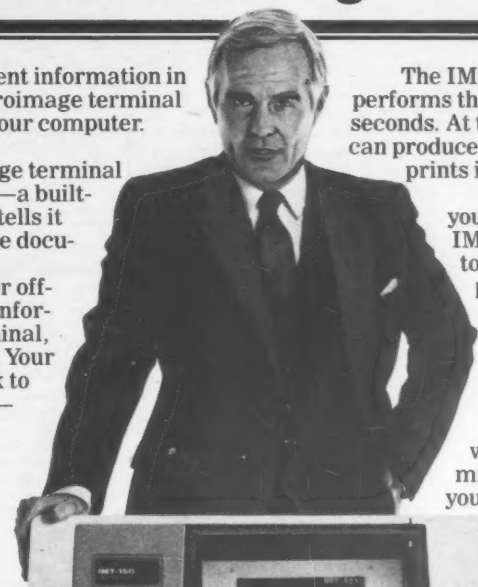
If a company wishes to do business overseas, it has to prepare huge quantities of English manuals and documents. At present, the laborious task of translating Japanese into foreign languages, mostly into English, and compiling such manuals is carried out manually. For non-English translations, the pool of qualified

How to take the strain off your mainframe with Electronic Filing from Kodak.

Storing original-document information in the Kodak IMT-150 microimage terminal can take the strain off your computer. Here's how.

The IMT microimage terminal has its own intelligence—a built-in microprocessor that tells it exactly where to find the document you need.

Once your computer off-loads the on-line index information to the IMT terminal, the terminal takes over. Your mainframe can go back to doing what it does best—manipulating data, not searching for it.



The IMT terminal is so fast that it performs these on-line lookups in seconds. At the push of a button. And it can produce dry, ready-to-use paper prints in seconds, too.

Want to make life easier for your filing staff as well? The IMT terminal is so fast and easy to use that it lets your workers perform more lookups. And it locates images so precisely that it almost does away with annoying lookup errors.

Take the strain off your computer and your staff with the Kodak IMT-150 terminal. It will take the strain off you, too.

Kodak

© Eastman Kodak Company, 1981

Eastman Kodak Company
Business Systems Markets Division
Dept. DP2577
Rochester, NY 14650

☐ Please send me more information about the Kodak IMT-150 microimage terminal.

☐ Please have a Kodak representative contact me.

Name _____ Title _____

Company _____

Address _____

City _____ State _____

Zip _____ Phone _____

IN DEPTH

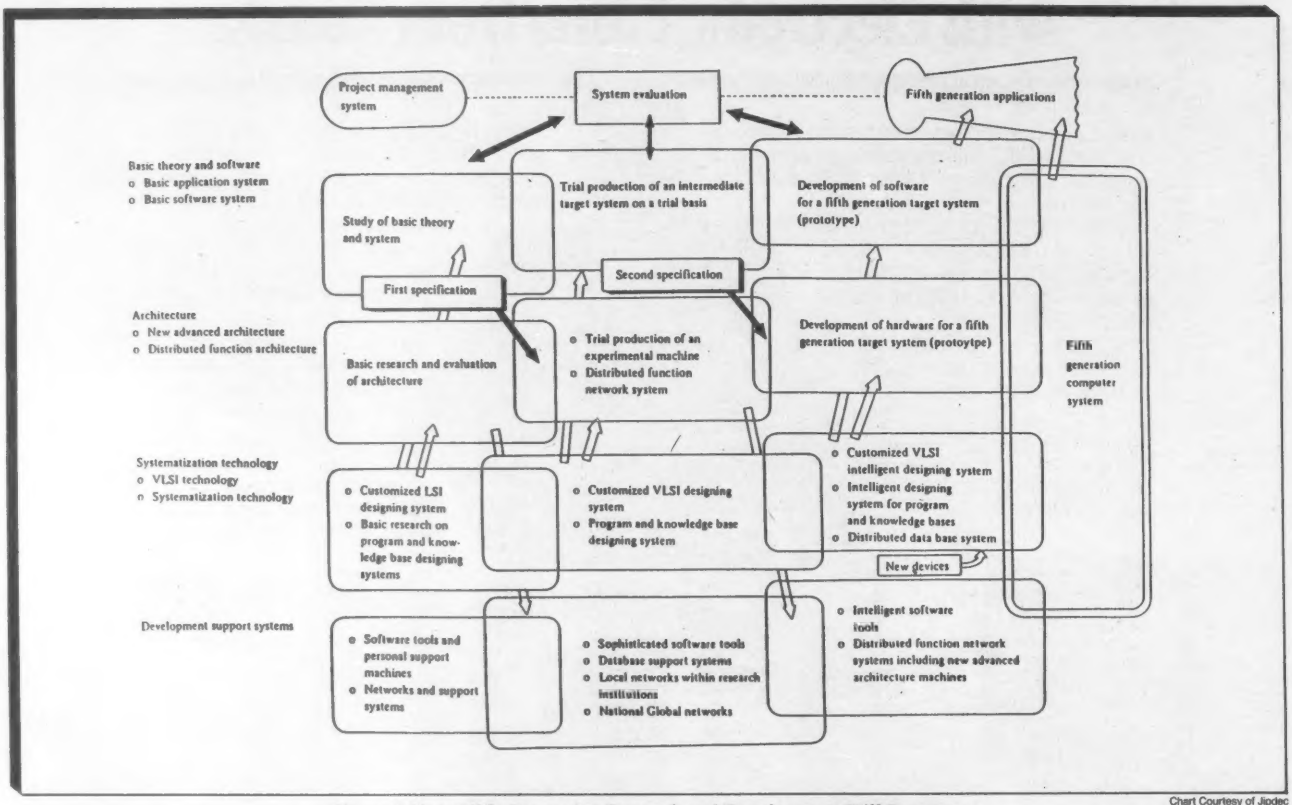


Chart Courtesy of Jipdec

Figure 4. How Fifth-Generation Research and Development Will Progress

translators is especially limited. A fifth-generation machine that could carry 80% of this translation burden would be a tremendous aid in international business exchange.

Themes in research and development for fifth-generation systems are shown in Table 1 (on In Depth/20), which contains seven groups and 26 themes. Research and development are classified into four divisions as shown in Figure 4.

The programs will be reviewed at early, intermediate and final stages, and achievements will be continuously reevaluated in light of new technological trends and developments. Prototypes of the fifth-generation computer system should be produced in the target year of 1990.

To carry out this research and development program smoothly, it will be indispensable to develop and complete as soon as possible powerful support systems such as software-development tools, high-function personal computers, VLSI-CAD tools, computer network systems and the like.

Conclusion

In the '90s, fifth-generation computer systems are expected to help human beings as friendly servants at every corner of society.

THE COMPLETE LINE OF LINE PRINTERS FOR YOUR HP MINI: 800-243-9054*

Digital Associates offers the same ChainTrain printer technology that HP offers, plus the widest selection of line printer systems plug-compatible with the full line of HP minicomputers, *or any other of your minicomputers.*

For Band, ChainTrain, Drum, Belt or Matrix technologies, call us toll-free, and our printer specialists will help you to pick the printer that meets your exact requirements. Digital Associates has 27 different models to choose from, so you don't have to settle for second best.

With prices up to 40% off the minicomputer vendor's list, delivery in 30-40 days, installation by factory-trained technicians and a nationwide service network, it's easy to see why Digital Associates is *the source* for minicomputer line printer alternatives.

The Printer Store

Digital Associates Corporation

1039 E. Main Street, Stamford, CT 06902 TWX 710-474-4583

(800) 243-9054 *In Connecticut call (203) 327-9210

VAX - 11

ON-SITE COURSES

• FORTRAN PROGRAMMER

Call toll-free for detailed course outlines. The cost is $3,200 per week. We also conduct several courses for RSX-11M.

Mini & Micro Educ. Services

(800) 824-7888 ext. M4573

(800) 852-7777 ext. M4573

In the coming two decades, businesses and organizations will develop modern office automation systems, in which both numerical and nonnumerical information may be quickly and interactively retrieved and analyzed in forms that are understandable and useful to both top management and middle management.

Fifth-generation computers will also change the very structures of businesses. Equally dramatic changes may be expected in our educational system, our personal life-styles and in every aspect of future society.

The purpose of the modern information system should be not only to improve the productivity of white-collar office workers and to displace personnel-related costs, but also to improve the quality of decision making and management through decision support systems; to save time, energy and resources; and also to realize human creativity — to seize the creative flashes in the human brain and bring them to fruition.

About the Author

Shohei Kurita is president of Computerworld Japan, Inc., a wholly owned subsidiary of CW Communications/Inc.

Before assuming his present position in January 1982, he was chief economist and senior manager of the Japan Electronic Computer Company Ltd. He was also involved in the electronic industry press with Dempa Shimbun, Inc. from 1953 to 1960.

Kurita has been a member of the Jipdec Committee for Study and Research on Fifth-Generation Computers since 1980. He worked with the Jipdec special "Computer White Paper" committee from 1969 to 1979, and he was a member of the Working Group Subcommittee, Information Industry Committee, Industrial Structure Council (an advisory arm to the Ministry for International Trade and Industry) from 1973 to 1974.

Kurita has published widely and has written two books under the pen name Masamitsu Kita: The Challenge of IBM, *Kyoritsu Publishing Co., 1978, and* Battles Between IBM and the Others, *1979.*

He also translated into Japanese Dick Brandon's and S. Segelstein's Data Processing Contracts, *published by Kyoritsu in 1981.*

Kurita studied mass communication at Sophia University, Tokyo.

DOS/VS(E) and CICS/VS

- SYSTEMS PROGRAMMING CONSULTING Consultants in Minneapolis, Wash. DC, and San Francisco, each with 10+ years experience.
- PROGRAM PRODUCTS 30 day trial. Full documentation on request.

BIMSPOOL DOS/VS(E) Terminal Printer Spooling
Retrieves batch print from POWER/VS queue, converts and prints on 3270-type terminal printer via CICS or SHADOW. Jobs may also be viewed on CRT. May be used to eliminate RJE printers. $4000 or $200/mo.

BIMSPOON On-line to Batch Print Spool
Used by DOS/VS(E) CICS/VS on-line application programs to create batch print reports under POWER/VS(E). Multiple tasks may create reports concurrently. If used with BIMSPOOL, reports may be spooled to 3270 terminal printers. $840 or $42/mo.

BIM-ODIS DOS/VSE CICS/VS Status Display NEW
Summary, detail, and analytic displays of CICS/VS, DOS, VTAM, and DL/I tables and control blocks. Used to determine CICS status and operational or performance problems. $2200 or $110/mo.

BIMSERV DOS/VSE Library and VSAM Catalog Display
Displays directories and entries in all DOS/VSE libraries, VSAM Catalog, Label Area, and VTOC's (CICS). $1480 or $74/mo.

BIMTEXT Word Processing System NEW
Create formatted documents from free-form input. Margin justification, numerous other formatting options, permit document changes without retyping other text. $2400 or $120/mo.

BIMDSLOG DOS/VS(E) Console Hard Copy File Display
Used by operators or programmers to review DOS/VS messages via CICS or SHADOW without tying up system console. $720 or $36/mo.

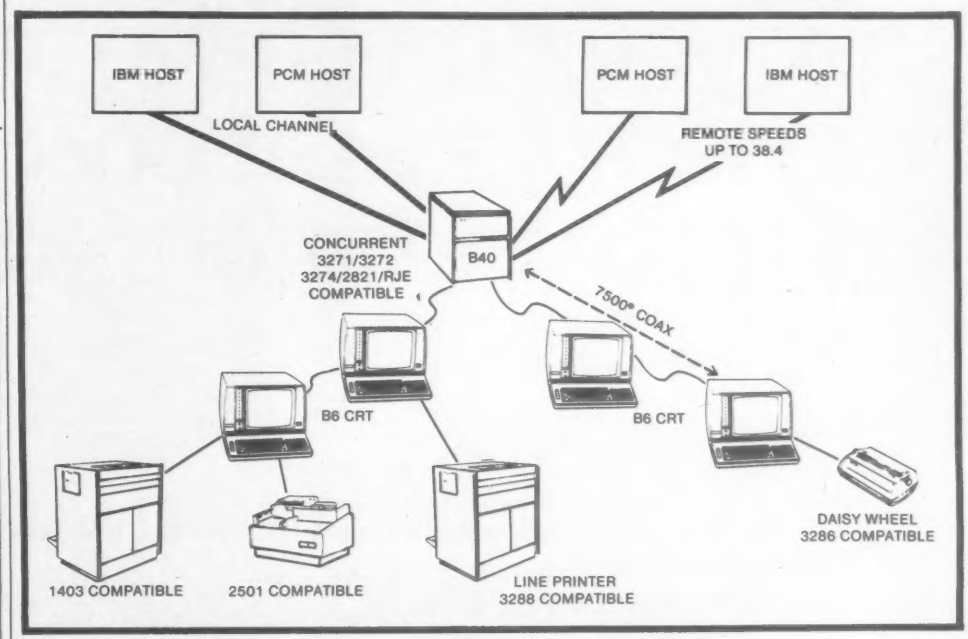
BIMMONTR DOS/VS(E) System Status and Queue Display
The original and still best DOS/VS(E) system activity, POWER/VS queue, and POWER/VS job output display system (CICS). Numerous options to assist operators and programmers. $920 or $46/mo.

BIMDEVC DOS/VS(E) Device Assignment Status
Displays logical unit assignments to devices (CICS). $360 or $18/mo.

BIMSUBMT DOS/VS(E) Job Submission Editing
On-line job stream editing, storage, and submission under CICS/VS. $1000 or $50/mo.

BIM BI MOYLE ASSOCIATES
4355 LYNDALE AVENUE SOUTH
MINNEAPOLIS, MN 55409
(612) 822-2661 Telex 290 123
Member Independent Computer Consultants Association

3270 USERS
BRAEGEN = COMPATIBILITY PLUS



GET THESE IMPORTANT BENEFITS

- **MULTIPLE HOST ATTACHMENTS.** A single B40 controller can attach to several IBM 360/370's or IBM compatible CPU's. Mix Local and Remote attachments. Reduced number of controllers.
- **SWITCHABLE CRT's.** Each B6 operator can switch between available host attachments (again, mix locals and remotes). Switch between different IBM addresses on the same 360/370. Often, one Braegen B6 CRT can replace several 3270's.
- **SHARE CABLES.** Braegen CRT's (and printers, too) can share the same coax. You don't need a separate expensive coax cable for each B6 CRT. Just daisy chain new B6 CRT's to existing coax.
- **LONG CABLES.** CRT's (printers, too) can be up to 7500 feet from the B40. Often, this lets you use local 3270's instead of remotes. Saves 370 software size, polling and you get faster response. Sometimes, this even saves you a separate controller.
- **BETTER 1/O.** A wider range of speeds, and better print quality than you'll find elsewhere for 3286/3288 compatible printers. 1403 compatible printers and 2501 compatible card readers can be located up to 7500 feet outside the computer room thus eliminating all the special TP gear you have with RJE.

PLUS ...Low cost and fast delivery.

Customers throughout the U.S. are receiving these benefits today. For more information please contact The BRAEGEN Corporation, 20740 Valley Green Drive, Cupertino, California 95014. (408) 255-4200

BRAEGEN
20740 Valley Green Drive
Cupertino, California 95014
(408) 725-1252
D200B

Now, you don't have to be in ten places at once to find software information.

Let's face it. Seeking out software information can be a time-consuming, complex job. What with all the reports, directories, information services, and any number of other sources to check...not only is the task difficult to complete ...but often almost impossible to begin!

That is, up until now. Meet...

Data Decisions·SOFTWARE

...It's going to dramatically change the way data processing professionals obtain software information.

First. Understand that this new SOFTWARE service is not comparable to any of the dozens of publications, directories and other services it replaces. Nothing makes the process of finding exactly what you're seeking simpler, faster, or as thorough. And regardless of whether it's for mainframes...minis...or micros... this is the SOFTWARE information tool that is really going to cut hours... perhaps even days from your search.

Best of all, DATA DECISIONS SOFTWARE is structured around a retrieval system that is neither complex nor unwieldy. Everything is conveniently cross-indexed by simple graphics: by operating system, application, function, vendor, and computer.

You'll even find the most comprehensive directory of software companies available anywhere...over 3500 vendors including their areas of specialization.

And if you're seeking a true reading on any of the industry's most widely-used software packages, they're given SPECIAL coverage. Not just listed, but analyzed in depth. Detail by detail. Expert assessment that pulls no punches in guiding you to exactly the "right" software decision.

In fact, you almost can't help but make the right decision!

12 times a year, DATA DECISIONS SOFTWARE will deliver the very latest, most accurate industry input available anywhere. Over 200 pages of carefully compiled updates and new reports each month. And you can add to that a VERY special extra feature. One you've always wanted, but never expected to find: a method that lets you...

Contents Include...

- Newsletter
- Vendor Directory
- Technology Reports
- User Ratings
  - Systems Software
  - Applications Software
- Systems Software Packages
  - Operating Systems & Utilities
  - System Administration & Monitoring
  - Data Management & Entry/Retrieval
  - Communications & Networking
  - Language Processors
  - Programming Support
- General Applications Packages & Services
  - General Accounting & Financial
  - Business Administration & Management
  - Industrial Administration & Management
  - Office Automation & Electronic Mail
  - Graphics & CAD/CAM
  - Mathematics, Statistics & Scientific
  - Timeshare, Database & Software Services
- Industry Applications Packages
  - Banking & Finance
  - Insurance
  - Real Estate
  - Legal & CPA
  - Wholesale/Retail Merchandising
  - Utilities & Communications
  - Government
  - Medical & Health Care
  - Education
  - Building & Construction
  - Electronics & Aerospace
  - Other Industries

FREE!

C7 ☐ Please contact me to let me know how I may arrange a trial review of *Data Decisions Software*.

B9 ☐ Yes! Please send me the free Executive Summaries of Applications and Systems Software User Ratings.

Name _____
(Please Print)

Title _____

Company/Organization _____

Address _____

City _____

State _____ Zip _____

Telephone _____ Extension _____

Data Decisions

P.O. Box 5805, Cherry Hill, N.J. 08034
800-257-7732 (In New Jersey, 609-429-7100)

W514

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY CARD
FIRST CLASS PERMIT NO. 3838 NEW YORK, N.Y.

POSTAGE WILL BE PAID BY ADDRESSEE

Data Decisions

P.O. BOX 5805
CHERRY HILL, NEW JERSEY 08034

You'll find it all here.

Use our coupon or reply card to obtain a

FREE

EXECUTIVE SUMMARY OF APPLICATIONS and SYSTEMS SOFTWARE USER RATINGS

...from **Data Decisions** T.M.

Ask actual users whether they're really satisfied!

You'll be able to do exactly that by referring to any, or all of the current user sites listed with EVERY in depth software product report. Frankly, there's no better way to reinforce your purchase decision than by talking with a colleague who already is working with the software you're contemplating ordering. This feature is exclusive to DATA DECISIONS SOFTWARE and includes the name and phone numbers of users near you.

There's so much in DATA DECISIONS SOFTWARE that must be experienced to be totally appreciated, we've now made it possible for you to...

Try DATA DECISIONS SOFTWARE with absolutely no obligation for purchase.

DATA DECISIONS SOFTWARE will change the way you find your software information...permanently. Make it happen. Respond today!

NEW! In one source...

- All available software...systems and applications, micros to mainframes.
- User lists with phone numbers.
- Reliable ratings.
- Analysis that pinpoint specific strengths and limitations.
- Access by operating system, application area, function, vendor, or computer.

Data Decisions·SOFTWARE

P.O. Box 5805, Cherry Hill, N.J. 08034, 800-257-7732 (In New Jersey, 609-429-7100)

C7 ☐ Please contact me to let me know how I may arrange a trial review of DATA DECISIONS SOFTWARE.

B8 ☐ Yes! Please send me the free Executive Summaries of Applications and Systems Software User Ratings.

Name _____ (Please Print)

Title _____

Company/Organization _____

Address _____

City _____

State _____ Zip _____

Telephone _____ Extension _____

W515

"We bought INQUIRE® in 1969; it still works for us every day."

Samuel Rock, Vice President Computer Information Systems
Steve Frycki, Director Systems Planning & Development
Paul Roskos, Manager Information Systems

In 1969, long before database management systems were in vogue, E.R. Squibb & Sons recognized the need to provide our research and development organization with a comprehensive information system for handling document text as well as all chemical and biological data. The system we sought had to handle the storage and retrieval of textual as well as numeric data, be operable in both batch and on-line modes, and most importantly, required a high level inquiry language that could be used by non-systems personnel. Ultimately, we evaluated INQUIRE, and were the first company to purchase it.

Our first use of INQUIRE was to develop document retrieval systems for both external literature and internally-generated documents. The system allowed us to do selective dissemination of information, retrospective searching, and the generation of camera-ready copy for publications containing new references, to be distributed to worldwide research and development personnel.

Following automation of our document retrieval and publishing system, known as Squibb Science Information System, we extended the use of INQUIRE to the more complex Chemical-Biological Computer System (CBCS). This system contains chemical and biological testing data on every Squibb compound, including the graphic chemical structure. The advantage of CBCS is that in one display, a researcher can retrieve any combination of chemical structure and biological test data, and can view the graphic chemical structure of the compound(s) in which he has interest, as well as any data from any of the biological tests performed on the compound. The inventory management and distribution of these compounds for testing is also handled by INQUIRE.

The key point is that within a relatively short span of time, using INQUIRE, we were able to automate a considerable portion of the overall information management needs of our research and development organization. We have recently applied INQUIRE to business applications as well, including retrieving quality control historical information and development of a call reporting system for our sales organization.

INQUIRE has been, and will continue to be, an important database management tool in our productivity arsenal for new applications development.

If you run MVS, VS-1 or VM, productive software from Infodata can help solve your information problems. Call us today to find out exactly how.

Infodata

Infodata Systems Inc.
5205 Leesburg Pike
Falls Church, Virginia 22041
800-336-4939
In Virginia, call 703-578-3430
Offices in:
Dallas, Los Angeles, New York
Rochester, NY, St. Louis, Washington, DC

®INQUIRE is the registered trademark of Infodata Systems Inc.

©1981 Infodata Systems Inc.

With Mini-Based PBX

Consulting Firm Makes Right Connection

MENLO PARK, Calif. — After abandoning its old private branch exchange (PBX) and service bureau, SRI International, Inc. went to in-house minicomputers and a newer PBX to handle voice traffic and call detail recording.

Purchase of the system "did affect a sizable savings on long-distance calls," according to Bud Devert, telecommunications analyst for SRI. The company also realized savings through personnel reduction and better management of in-house and long-distance calls. SRI is a research and consulting service firm with clients in business, industry and government.

Research and evaluation of available management systems led company officials to abandon the company's old PBX and service bureau in favor of Northern Telecom Systems Corp. Model 435 and Model 455 minicomputers with call management system software to work with the new SL-1 XL PBX.

According to Lloyd Schuknecht Jr., SRI's director for security and telecommunications services, this system has eliminated the problem of how to spread peak-volume demands over the business day. When SRI's operators would arrive at work at 7 a.m., it was already 10 a.m. on the East Coast, he explained. "We used to have one very heavy hour before the East went to lunch," he said, "and another when they returned.

"During this period it was quite burdensome for our attendants to record call information manually," Schuknecht said. Now, at speeds of 4,800 bit/sec, SRI receives accurate records on every call, he added.

The SL-12 XL system supports about 5,200 lines and 156 trunks. It connects directly through call data recording (CDR) ports with the Model 435 and Model 455 minicomputers. The Model 435 caputures call records, while the Model 445 serves both as a backup capture device and a call data processor.

Northern Telecom CRT terminals for monitoring and directory search are located within the main facility. Each minicomputer has 10M bytes of disk storage. The Model 445 drives a Northern Telecom Sprinter printer and a 9-track 1,600 bit/in. tape drive.

A caller using the telephone system keys in a three-digit long-distance code, an assigned charge number, the area code and the number being called. The SL-1 automatically searches for the most economical route, creates a charge record and retains the record in a storage register until the optimum trunk group and trunk member have been selected.

The system then records time, date, trunk group and trunk member. Upon completion of the call, costs are checked and the charge record is coupled with the call record. If the most economical route is busy, the SL-1 takes the caller through the second most economical route, and if that is busy, then the third most economical route is selected. In the event all three are busy, the caller receives a 30-second delay and the call is sent out over a direct dial

(Continued on Page 86)

Hitachi Unveils Local Network With Fiber Optics

NEW YORK — Hitachi, Ltd. is offering a fiber-optic local-loop network designed for use in office buildings.

Users of computers, data terminals and telephones in a building equipped with the network can communicate with each other through compact link controllers installed at a number of points throughout the building, the vendor claimed.

The job of the compact link controllers is to convert back and forth between electric and light signals, allowing various office machines to transmit data over the system's optical fibers at speeds up to 32M bit/sec.

The maximum number of link controllers that can be included in the loop network is 64, and each controller can be shared by up to 64 computers, data terminals, word processors, facsimile machines and telephones, according to a Hitachi spokesman.

The link controllers cost approximately $21,000 each, Hitachi said from 22nd Floor, 77 Water St., New York, N.Y. 10005.

IBM Micro Gets Ties to Mainframes

TORRANCE, Calif. — Local Data Co. has unveiled a protocol converter designed to link IBM Personal Computers with IBM mainframes. IBM Personal Computers operate asynchronously with Ascii code while IBM mainframes use Binary Synchronous Communications protocol and Ebcdic code.

The Datalynx 3270 emulates IBM's 3271-2 cluster controller and will support two IBM Personal Computers. It allows users to use the Personal Computer for DP problems related to their local environment while still having access to company data on an interactive basis, a spokesman said.

Communications between the two computers can be carried out over dial-up lines since the Datalynx offers the option of dial-up or dedicated line use.

The protocol converter costs $1,950 from Local Data at Suite 706, 2701 Toledo St., Torrance, Calif. 90503.

Terminal Handles Communications

SUNNYVALE, Calif. — Televideo Systems, Inc. has announced the Intelligent I, a CRT terminal that includes local data processing and communications capabilities.

A user can customize his terminal to serve as a computer station for local processing, as an intelligent front end for transaction processing applications or as a node in a communications network, the vendor said.

The unit is equipped with a Zilog, Inc. Z80A microprocessor, which is compatible with Digital Research, Inc.'s CP/M operating system. The terminal comes with 64K bytes of random-access memory for program storage or local processing. Two RS-232C ports are available. One can be used for a printer interface and the other for a standard computer interface. An RS-422 port is also included for high-speed communications, the vendor said.

The Intelligent I costs $1,795, the vendor said from 1170 Morse Ave., Sunnyvale, Calif. 94086.

- Integral RJ11 Jack for Telephone
- Voice/Data Switch on Front
- LED Carrier and Data Indicators
- EIA and Optional Current Loop Interface
- Small Size: 4x5x1½ Inch

YOUR CHOICE!

Two choices from our family of 300 Baud Bell 103/113 compatible modems.

- Integral Modem and Telephone
- Pushbutton Dial on All Lines
- Auto Dial of Stored Number
- Auto Voice/Data Switch
- Auto Disconnect
- Auto Answer — $60 Additonal
- LED Carrier, Ring, Data and Mode Indicators

Choose one and send coupon for more information.

305E2-12 modem $147.00 ☐

☐ $277.00 370E2-12 phonem

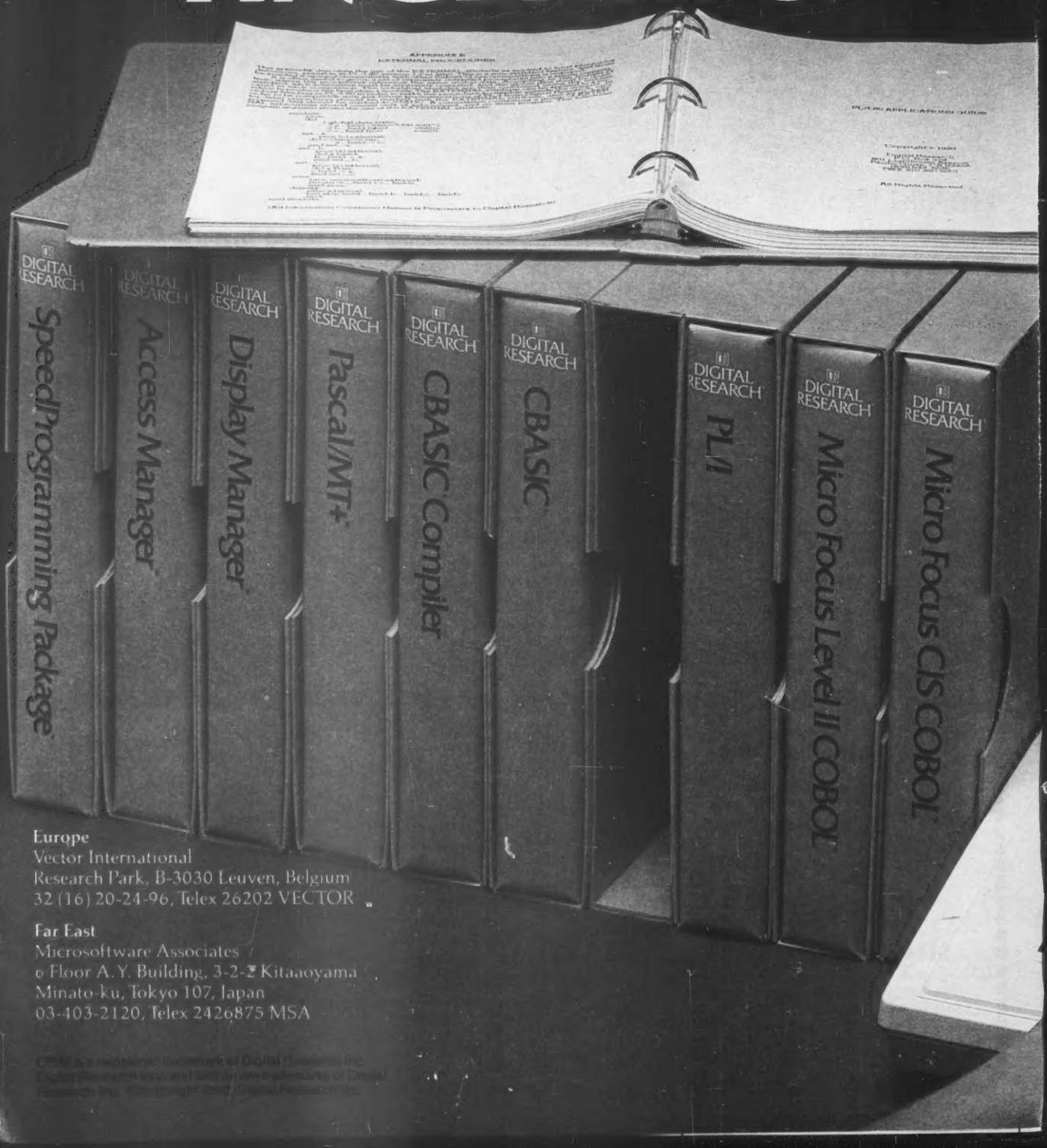
☐ Acoustic Couplers ☐ Medium Speed Modems ☐ High Speed Modems
☐ Time Division Multiplexers ☐ Frequency Division Multiplexers

Please check items of interest and return to us for additional information

ComData
We can get you there from here.
7900 N. Nagle
Morton Grove, IL 60053 312/470-9600
New York 212/267-3696
Los Angeles 213/624-0550
member of IDCMA

name _____
company _____
street _____
city _____ state _____ zip _____
telephone _____ ext. _____

PRODUCTIVITY AT YOUR FINGERTIPS.



Europe
Vector International
Research Park, B-3030 Leuven, Belgium
32 (16) 20-24-96, Telex 26202 VECTOR

Far East
Microsoftware Associates
6 Floor A.Y. Building, 3-2-2 Kitaaoyama
Minato-ku, Tokyo 107, Japan
03-403-2120, Telex 2426875 MSA

CP/M is a registered trademark of Digital Research Inc.
Digital Research is a trademark of Digital Research Inc.

Tools for more powerful programming.

The creators of CP/M® bring you the most powerful library of languages and utilities on the market. Developed to increase programmer productivity and to produce top quality applications, our languages allow you to work efficiently with both 8 and 16-bit microcomputers. Digital Research utilities reduce coding and designing effort for speedier programming and higher productivity. Our languages and utilities comprise the finest collection of microcomputer programming tools available anywhere.

When you're designing microcomputer software use proven Digital Research languages and utilities. You can count on the highest standards in software and support from the company that made CP/M the most accepted microcomputer operating system. For information, call or write Digital Research (408) 649-5500 or (408) 649-3896, 160 Central Avenue, Pacific Grove, California 93950.

DIGITAL RESEARCH™

The creators of CP/M.®

RJE Workstation Programs Fit DG MV8000s, MV6000s

PALO ALTO, Calif. — Gamma Technology, Inc. has introduced a line of remote job entry (RJE) workstation programs for Data General Corp. MV8000 and MV6000 series computers. The following run under DG's AOS/VS multiprogramming operating system:

- Workstation 200, for RJE to any Control Data Corp. mainframe using CDC's UT200 protocol.
- Workstation IBM Hasp.
- Workstation NTR, for RJE to any Univac Corp. mainframe running Univac's NTR protocol.
- Workstation X780, for RJE to any mainframe running IBM 2780/3780 terminals.

The initial CPU license fee is $4,000 from Gamma at 2452 Embarcadero Way, Palo Alto, Calif. 94303.

Micom Modem Debuts

CHATSWORTH, Calif. — Micom Systems, Inc. has introduced a modem for use in local-area networks that is said to operate at speeds up to 19.2K bit/sec. It can be used for point-to-point or multidrop configurations.

It is possible to use the Micom 400 Model 420 modem with as many as 16 terminals on a single multidrop line. The line drivers are capable of operating at any of several data rates within their range, the vendor said.

Operation of the modem is switch-selectable between two-wire and four-wire links, and its design is said to allow user installation.

The modem is available for $290 from Micom Systems, which is located at 20151 Nordhoff Ave., Chatsworth, Calif. 91311.

PBX Directs Voice Traffic

(Continued from Page 83)

trunk. Attendants are no longer required to place long-distance calls, with few exceptions.

According to Devert, company officials were able to track a number of "nuisance calls," such as personal calls, through the charge codes used and extract restitution. Often, subcontractors would make a number of unnecessary calls, Devert explained, which SRI also tracked down and received payment for.

"We don't discourage use of the telephone," Devert said. However, he added, personal calls are discouraged. "We don't have that problem here."

Installation of the minicomputers and PBX has meant a reduction in switchboard personnel and a subsequent savings to SRI, since the system is capable of placing long-distance calls at any hour of the day without operator assistance, Devert said. "We used to have 10 to 11 switchboard positions," he explained, "It's now three."

Each day, all volume data is transferred via magnetic tape from the Model 435 to the Model 445, where it undergoes editing. An edited magnetic tape output from the Model 445 is then fed into SRI's large in-house mainframes, where the data is processed, generating a direct bill-back record to each user. "We'll shortly be implementing using an automatic link from the 435 to the 445," James Davis, senior management information services analyst, said. With the system, each call that goes through the SL-1 can be displayed on the CRT terminal, permitting all call records to be monitored in real time. Each day, moreover, the operators can produce a hard-copy listing of every call that went through the SL-1.

Another advantage of the CDR system is its reporting flexibility. Chargeback reports are easily created for use by SRI for internal administrative purposes. Weekly customized financial reports generated by the mainframe from information provided by the Model 445 call data are distributed to managers of the 500 to 1,000 different ongoing projects, according to Schuknecht.

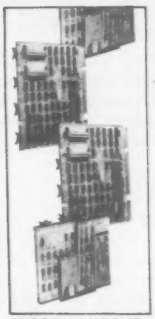
The reports help project managers as well as members of SRI's communications staff. As a direct result of the SL-1 switch and the CDR system, CDR now keeps total track of call records from the time they are first placed, all the way through to completion.

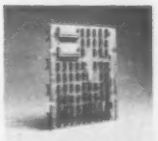
DIGITAL'S SPRING SALE

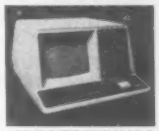
OFFER ENDS JUNE 25th

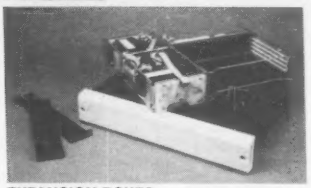
SAVE UP TO 89%

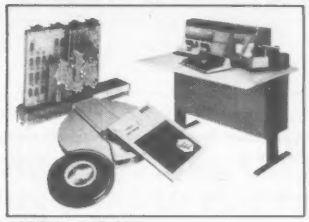
DISKS/TAPES


MISCELLANEOUS

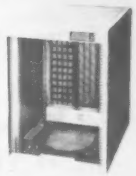

MEMORIES/COMM


VIDEO TERMINALS


EXPANSION BOXES


SPECIAL OPTIONS

PRINTERS


CABINETS

To order simply call any weekday between 8:30 am and 6:00 pm Eastern time. You must agree to accept immediate delivery. All sale items fully warranted for 30 days (return to factory).

All purchase orders should be mailed to:
Digital Equipment Corporation, P.O. Box CS2008, Nashua, NH 03061.

CALL 800-258-1710 now while quantities last. DIGITAL reserves the right to limit order quantities.

In New Hampshire, Alaska and Hawaii, call: 603-884-6660.

ALL PRICES IN U.S. CURRENCY. NO OTHER DISCOUNTS APPLY.

Check this ad weekly for new items going on sale.

PART NUMBER	DESCRIPTION	LIST PRICE	DISCOUNT	SALE PRICE
DISKS				
RK05F-AA	19.2 MBIT DEC PACK DISC TO REPLACE RK03 120/60	$ 6300	56%	$ 2800
RM02-AA	SOLD OUT ES SOLD OUT 240 SOLD OUT 76 SOLD OUT	SOLD OUT	3 SOLD OUT	14210
	H9691, 120/60			
RM03-AA	SINGLE ACCESS 67 MBYTE 3600RPM CDC 9762 DISK, H9691, 120/60	20300	30%	14210
RLV11-AK	LSI/11 CTL + RL01 + RL01K-DC	6400	30%	4480
RL11-AK	UNIBUS CTL + RL01 + RL01K-DC	6400	30%	4480
TAPES				
TU58-VA	TU58-VX (DUAL DRIVE), TU58-VB (I/O CABLES, MEDIA, DC PWR CABLE)	1500	50%	750
EXPANSION BOXES				
BA11-PE	6 SYSTEM EXPANDER BOX W H7420-A PS, NO CORE REG, 120Vac	4150	50%	2075
BA11-VA	H9281-BA, H7833-A, 120Vac (13.4"W, 3.6"H, 11.7"D)	700	50%	350
H334-E	H334-X W H7872-A POWER SUPPLY, 120Vac	1350	50%	675
CABINETS				
H9610-AC	11V03-L CAB 30" W/O POWER CNL	1350	50%	675
H9612-AC	11T03-L CAB 40" W/O POWER CNL	1690	50%	845
H9613-AC	40" CAB W/SOLID TOP W/O PC	1690	50%	845
MISCELLANEOUS				
FP11-EA	FLOATING POINT (23 + 9 OR 55 + 9) PROCESSOR, H7421-C, 120Vac	6400	70%	1920
KE11-E	EXPANDED INSTRUCTION SET (MULTIPLY, DIVIDE, SHIFTS), FOR 11/35, 11/40	1900	53%	900
KE11-F	FLOATING POINT INSTRUCTION SET FOR 11/35, 11/40	1900	53%	900
KT11-D	MEMORY MANAGEMENT FOR 11/35, 11/40	3350	55%	1500
KY11-LB	PROGRAMMERS CONSOLE	950	30%	665
REV11-A	EXT REFRESH + BOOT + TERM	360	53%	170
REV11-C	EXTERNAL REFRESH + BOOT 1	360	53%	170
VK8-AB	SOLD OUT BO SOLD OUT L SOLD OUT CH SOLD OUT	SOLD OUT	7 SOLD OUT	315
COMMUNICATIONS				
DPM23-A	KDF11-AA, MSV11-DD, ISV11-B, BA11-NC, QJ642-AZ RSX-11S, QJ658-AZ, 120Vac	11500	30%	8050
DPM50-FA	INTELLIGENT I/O SUBSYSTEM KDF11-AA, H333-A TEV11, MSV11-DD, ISV11-A, QJ642-DZ RSX11-S, QJ655-DZ, QJ658-DZ, 120Vac	11450	30%	8015
DRV11-00	PARALLEL INTERFACE UNIT	300	15%	255
H326W	H326 EXCEPT NO COVER OR STRAIN RELEASE	275	50%	135
DRV11-J	64 LINE PARALLEL INTERFACE	450	20%	360
DLV11-F	EIA & 20mA ASYNCH SLU	370	30%	255
DH11-AA	16 ASYNC LINE MUX DIST PANEL & 120Vac PS PROG LINE SPEEDS	8800	50%	4400
ISB11-A	SOLD OUT SE SOLD OUT NTR SOLD OUT, M8202-YE 56KBAUD, 1 WIRE DAISY CHAIN TO RT800 SERIES	SOLD OUT	SOLD OUT 70	SOLD OUT 2535
DPM50-HA	SOLD OUT CE SOLD OUT, QJ SOLD OUT QJ658-AZ, 120Vac	SOLD OUT	SOLD OUT 30	SOLD OUT 8845

PART NUMBER	DESCRIPTION	LIST PRICE	DISCOUNT	SALE PRICE
PRINTERS				
LA180-EA	SOLD OUT LA SOLD OUT NTE SOLD OUT 60	SOLD OUT	$ SOLD OUT 7	SOLD OUT $ 1335
LA36-CE	KEYBOARD DECWTR 120/60 20mA	2970	80%	550
LA36-CJ	KEYBOARD DECWTR 240/50 20mA	2970	80%	550
LA36-DE	LA36-DK W/20mA	1835	70%	550
LA36-DK	LA36 20mA W/O CABLE 120/60	2695	80%	535
LA3-DN	LA36-DJ W NO RIBBON, PAPER, CABLE, 240/50	2695	80%	535
LA36-HE	KEYBOARD DECWTR 120/60 EIA	3080	80%	615
LA35-CE	REC ONLY DECWTR 120/60 20 mA	2475	80%	495
VIDEO TERMINALS				
VT55-FA	GRAPH TERM W/COPY 120/60 20mA	5830	70%	1745
VT110-AA	DPM01-M + AVT100-AA, 120 Vac USA LINE CORD	6325	50%	3160
VT52-AC	SOLD OUT RE SOLD OUT 9 SOLD OUT	SOLD OUT	SOLD OUT 8 SOLD OUT	500
	100/120 Vac, 50/60 Hz			
VT62-AC	WITH EIA W CONT 120 Vac	3350	85%	500
VT100-NB	SOLD OUT VT SOLD OUT OR SOLD OUT 24	SOLD OUT	SOLD OUT 2 SOLD OUT	1500
VT110-AB	DPM01-MS + VT100-AB, 240Vac USA LINE CORD (50Hz)	6325	50%	3160
VT55-FB	VT52-BB W GRAPHING CAPABILITIES, 220/240Vac 50/60 Hz	5830	70%	1745
MEMORIES				
MF11-UP	32KB CORE IN DOUBLE SYSTEM UNIT, ROOM FOR ADDITIONAL 32KB, UNIBUS INTERFACE	9600	84%	1500
MF11-WP	64KB CORE IN DOUBLE SYSTEM UNIT, ROOM FOR ADDITIONAL 64KB, UNIBUS INTERFACE	10100	75%	2500
MK11-BE	128 KBYTE MOS MEM EXPANSION (2 MS11-KE)	17200	70%	4995
MM11-DP	16K 18 BIT 18 MIL PARITY MEM, ONE 1" BOARD	5750	70%	1725
MM11-UP	32KB CORE, ADD-IN FOR WF11-UP	8600	86%	1200
MM11-WP	64KB CORE, ADD-IN FOR MF11-WP	8500	76%	2000
MM8-AA	8K X 12 MEMORY, G649 + H219-A, 1.5 μSEC	2875	74%	750
MM8-AB	16K X 12 MEMORY, G649 + H219-B, 1.5 μSEC	3680	74%	950
MM8-EJ	8K X 12 BIT 18 MIL MEMORY, 1.5 μSEC	2050	51%	1000
MRV11-AA	PROM/ROM MEMORY UNIT	210	55%	95
MRV11-BA	PROM MEMORY UNIT	390	55%	175
MS11-JP	16K MOS MEMORY 11/04-34	3450	70%	995
MS8-CB	32K 32 BIT MOS RAM, 4K CHIPS (M8417-BA)	3850	66%	1300
MSV11-DC	16K BY 16 RAM	500	30%	350
MSV11-DD	32K BY 16 RAM	500	15%	425
MS11-FP	8K 18 BIT MOS RAM (M7847-AD)	2250	89%	250
MXV11-AC	32KB RAM, 2 ASYNC EIA SLU, SOCKET FOR 2-24 PIN 5V ROM (M8047-CA)	750	30%	525
MM11-YP	32K 18 BIT MEMORY, ONE 1" BOARD	8500	78%	1890
MS11-LB	128KB MOS MEMORY FOR 11/34A	2400	30%	1680
SPECIAL OPTIONS				
CD11-A	CR04-E 1000 CPM TBLE TOP RDR (DOC M1000) + CD11 CONT, 120/60	13920	41%	8250
CD11-B	CR04-F 1000 CPM TBLE TOP RDR (DOC M1000) + CD11 CONT, 240/50	13920	41%	8250
CD11-EA	CR04-K 1200 CPM CONSOLE RDR (DOC RS1200) + CD11 CONT, 120/60	26800	56%	11700
CMS11-JC	CM11 CONT + DOC TM600 MARK/HOLE SENSE CR, 600 CPM, 120/60	11300	27%	8250
CTS11-JB	SOLD OUT CO SOLD OUT DA SOLD OUT PU SOLD OUT	SOLD OUT	SOLD OUT 5	SOLD OUT 2500
	ASCII, 8-BIT HOLLERITH			
LP11-VN	SOLD OUT P SOLD OUT 9 SOLD OUT	SOLD OUT	SOLD OUT 5	SOLD OUT 8000
LP11-YE	LP06-YE + LP11 CONT 120/60	22400	42%	13000
LP11-ZE	SOLD OUT P SOLD OUT 50 SOLD OUT	SOLD OUT	SOLD OUT 4	SOLD OUT 13000
RP04-H	UNIT SELECT SWITCH KIT	1000	70%	300

CALL 800/258-1710

In New Hampshire, Alaska and Hawaii, call: 603-884-6660.

DIGITAL EQUIPMENT CORPORATION
460 Amherst Street Nashua, NH 03063

digital

TRT Introduces Terminal Series To Ease Service Use

WASHINGTON, D.C. — TRT Telecommunications Corp. has introduced a series of terminals to facilitate customer use of the firm's worldwide communications services.

The Constellation series includes the Aries and Orion terminals — operating at 50 bit/sec on telex channels and 1,200 bit/sec on direct distance dial lines — as well as the 50 bit/sec Phoenix terminal and the 110 to 300 bit/sec Pegasus machine.

Aries and Orion feature word processing and text editing capabilities, message documentation and recordkeeping functions. The Aries terminal can access four networks simultaneously, while the Orion offers greater program storage capability, according to the vendor.

The Phoenix, designed for medium-size companies, is an electronic teleprinter. The Pegasus terminal, for small-volume users, is a portable desktop unit that uses the telephone system to send and receive telex traffic, a vendor spokesman said.

Aries costs $130/mo; Orion, $170/mo; Phoenix, $120/mo; and Pegasus, $30/mo. TRT is located at 1747 Pennsylvania Ave. N.W., Washington, D.C. 20006.

Software Links DEC Users To Input Ports of Remotes

MORRIS PLAINS, N.J. — Zia Corp. has announced the availability of a software product that allows users of Digital Equipment Corp. machines to establish a virtual connection between their terminals and an input port of nearly any remote computer system.

The Virtual Terminal (VT) connection is a software one, requiring no switches, cable changes or system modifications, according to the vendor. No special software is required at the remote computer either. Once the connection is made, the user can communicate freely with either the local or the remote computer system. Text files resident on either system can be transferred to the other via simple user commands, the vendor said.

Other commands provide the user with full control over line characteristics, including transmission rates, echo and X-on/X-off control sequences. Also, the product reportedly provides full support for the DEC DF03-AC autodialing modem, permitting the user to initiate and terminate calls to remote computers without access to a modem or telephone.

VT is priced at $650, a Zia spokesman said from the firm, which can be reached through P.O. Box 351, Morris Plains, N.J. 07950.

Stat Mux Out For Remotes

NEWPORT, R.I. — A stand-alone statistical data multiplexer designed for remote data entry applications has been introduced by Scitec Corp.

The Mux25 Data Concentrator reportedly permits four asynchronous CRT and/or printing terminals at a remote location to be linked with a single minicomputer via a single telephone line. The product incorporates various systems management features used via English-language menu-driven screen prompts, according to the vendor.

Operated in pairs point-to-point, the rack-mountable Mux25 has no intermix restrictions on channel speeds or formats and is completely end-to-end independent of channel characteristics, the vendor said. Optionally available with one synchronous and three asynchronous channels, the unit provides extensive networking capability when used with the Scitec CPX25 communications processor.

The Mux25 Data Concentrator is base priced at $1,200 in single units. Scitec is headquartered at 126 Thames St., Newport, R.I. 02840.

Micro Designed For WP Interface

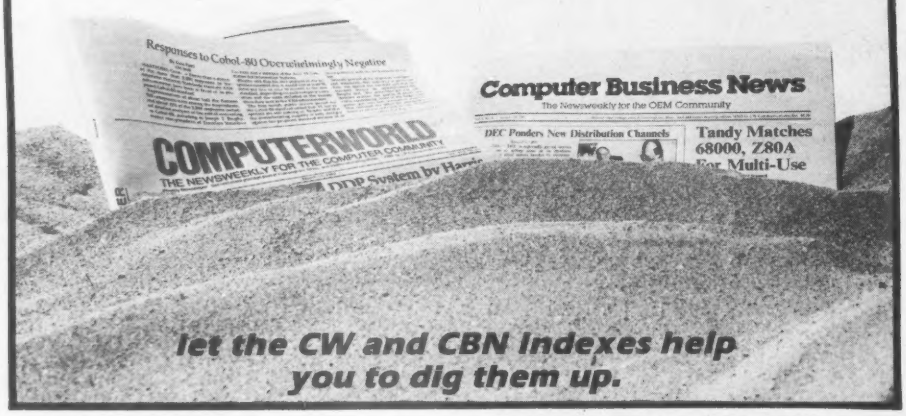
HICKSVILLE, N.Y. — A microcomputer that boasts communications capabilities has been unveiled by Microcomm, Inc.

The MC-100 was designed for word processor/public network interfaces. It reportedly performs network activation, log-on sequence, handshaking with remote system, code, speed and protocol conversion. Standard features include automatic redial, alternate routing, single- or multiple-address routing, user menu call prompting or call status, station identification and quick disconnect.

The basic system measures 12 in. by 8 in. by 4 in., weighs 4 lb and comes with one bidirectional port, with a second associated with its internal modem. Standard modem interfaces include Bell Laboratories' 103, 202 and 212. Ports can be added as needed, up to a total of eight.

The MC-100 is base priced at $800, a Microcomm spokesman said from 33 Cotters Lane, East Brunswick, N.J. 08816.

If you've got 9,792 pages of important data from your 1981 copies of Computerworld and Computer Business News buried somewhere —



let the CW and CBN Indexes help you to dig them up.

Computerworld and *Computer Business News* average about 192 pages a week, 51 weeks a year, combined. Each issue has data you can't afford to lose. Special product reports, new product introductions, government regulations, news on contracts, companies, mergers, in-depth reports on new technologies — material you will need all year long. And, as we've learned from answering frantic phone calls in our editorial departments, when you need information on stories we've run, you need it right away.

With the *Computerworld* and *Computer Business News* indexes, you can put your hands on thousands of major headings, minor headings and individual entries. They cover everything from ACCOUNTING SYSTEMS (96 entries) to ZEUS II SYSTEMS (1 entry) in *Computerworld* and from ACQUISITIONS AND MERGERS (64 entries) to Z-LAB SYSTEM (1 entry) in *Computer Business News*. Look at some of these headings:

Index	Heading	# Entries
CBN	ACCOUNTING SYSTEMS	77
CBN	COMMUNICATIONS	33
CBN	DISK EQUIPMENT	173
CBN	GRAPHICS SYSTEMS	137
CBN	MICROCOMPUTERS	83
CW	DATA ENTRY SYSTEMS	20
CW	LITIGATION	97
CW	MAINTENANCE	25
CW	SOFTWARE PACKAGES	65
CW	TAPE EQUIPMENT	30

And that's just a small sample of the type of information you'll find in these two books for just one year! We also have indexes for *Computerworld* that go all the way back to 1976. CBN's first index is available, and it's a combined issue for 2 months in 1978 (when CBN first appeared) and all of 1980.

If you don't have all the back issues of *Computerworld* and *Computer Business News* that you need to get the articles you want, you can order back copies for an entire year on 35 mm microform from University Microfilm, Int. at very reasonable rates. Or you can simply take advantage of their reprint service for individual articles. (More information is found right in the indexes themselves.)

MAIL THIS ORDER FORM TODAY!

MAIL TO: CW/CBN Indexes, Circulation Dept., 375 Cochituate Rd., Box 880, Framingham, MA 01701

Please send me the following indexes:

Year	Index	Price	Quantity	Total $
1981	Computerworld	$ 35.00	____	____
1981	Computer Business News	$ 35.00	____	____
1980 thru 1978	Computer Business News (in one book)	$ 45.00	____	____
1980	Computerworld	$ 30.00	____	____
1979	Computerworld	$ 25.00	____	____
1978	Computerworld	$ 20.00	____	____
1977	Computerworld	$ 20.00	____	____
1976	(last half) CW	$ 15.00	____	____
All Computerworld Indexes		$100.00	____	____

Add $1.25 shipping and handling for one book and 75¢ for each additional book. If your check is enclosed, we pay shipping cost. ____

Total cost ____

☐ Check enclosed ☐ MA Expiration Date ____
☐ BA/Visa (MC only — List four digits above your name)

If a charge, we need your signature ____

Name ____

Firm ____

Street ____

City ____ State ____ Zip ____

STC Unveils Tape Control, Switching Feature

LOUISVILLE, Colo. — Storage Technology Corp. has announced the STC 4500, a buffered tape control unit for IBM 370, 30 series and compatible processors. The firm also announced a tape-switching feature for the unit.

In a related announcement, STC also announced a larger storage capacity for its 4305 Model-6 disk storage subsystem.

The STC 4500 features a 32K-byte buffering feature that reportedly increases throughput capabilities of tape subsystems, especially when attached to data streaming channels. The feature also allows other peripherals to coexist on the same channels as the 4500, the vendor said.

The unit attaches directly to the selector channels, block multiplexer channels and data streaming channels on IBM and software-compatible systems. The 4500 costs $12,000, or $321/mo on a 36-mo agreement.

A tape-switching feature, which increases the number of tape drives a control unit can access from eight to 16, costs $7,510, or $113/mo on a 36-mo agreement, the vendor said.

STC also increased the storage capacity of its 4305 Model-6 disk storage subsystem from 16K to 64K bits. The units cost between $140,385 and $679,055, depending on the configuration, the vendor said.

STC is located at 2270 S. 88th St., Louisville, Colo. 80027.

Pro-Log Disk Pack Supports STD Bus

MONTEREY, Calif. — Pro-Log Corp. has introduced a disk pack incorporating mass floppy disk storage and supporting a user-configurable STD Bus microcomputer.

The Model 702 STD Disk Pak was designed for STD Bus system applications that require mass storage, such as data collection, process control and automated test equipment. It contains two thin-line 8-in. double-sided, double-density floppy disk drives.

The Model 702 will be available in September for about $4,000. Pro-Log is at 2411 Garden Road, Monterey, Calif. 93940.

Emulex Storage Adapters Link Tape, Disk on VAX

SANTA ANA, Calif. — A series of mass storage adapters designed to interface both disk and tape peripherals, and thereby increase the capabilities of Digital Equipment Corp. VAX-11/780 superminicomputers, have been unveiled by Emulex Corp.

The VAX-Master/780 adapter plugs into a VAX processor and consists of four printed circuit boards. The device basically allows a combination of disk and tape units to be connected to the VAX computer through a single source, freeing up slots for extra peripheral devices.

The first two boards contain basic interface circuitry that connects to the computer's synchronous backplane interconnect bus terminator, while the remaining boards are left for the installation of either one or two Massbus-compatible peripheral controllers, a spokesman said. The unit is powered by the 780's power supply or an external power supply.

Key to the device's operation is its internal bus interface design, which can translate protocols to adapt to different VAX machines. For instance, with the device, an Emulex SC780 single-board controller designed for the VAX-11/750 can be used on the 780 with a simple firmware change. The controller can be installed via the VAX-Master, permitting the use of virtually any storage module device disk drive in capacities from 80M to 675M bytes. Using the controller, the adapter reportedly provides emulation of DEC's RH780 with attached RM03, RM05, RM80 and RP06 disk drives and operates transparently to DEC's VAX/VMS and Bell Laboratories Unix operating systems.

The adapter can also handle a tape controller that supports ½-in. formatted tape drives, the spokesman stated.

Either of two standard RH780 or Synchronous Backplane Interconnect terminator locations can be used to mount the VAX-Master in the VAX-11/780 CPU.

The mass storage adapter costs $13,500 and is available from Emulex at 2001 E. Deere Ave., Santa Ana, Calif. 92705.

Bay Area Student Services Get Good Grades With Recap

LOS ANGELES — Despite cuts in the state's school budgets over the past several years, many California school districts have increased student services with the help of a computer system at the Santa Clara County Office of Education's Regional Center for Automated Processing (Recap).

The system started automating basic student records 16 years ago. Today Recap serves school districts in every Bay Area county and many others throughout the state. Its computer systems process records for 250,000 students, as well as financial and payroll/personnel documents for 45,000 county and district employees.

It has achieved all this growth without salesmen or slick literature. Its "better mousetrap" has brought school districts from as far as Hawaii and New Jersey to its door. And in an era when every dollar of California tax expenditure is undergoing stringent public scrutiny because of Proposition 13, educators have come to recognize that such DP services can cut costs.

Back in 1966, batch was the name of the game on an IBM 360 shared with county government. Today, dual IBM 4341s carry the vastly increased workload. With the new system came the capability to do almost all applications on-line.

Even five years ago, the conversion to teleprocessing was well under way on a 370 Model 145, and an IBM Communications Controller was at work directing a terminal network. Then came Proposition 13.

"When Proposition 13 was enacted, many employees here feared that schools and district offices would be forced to give up using our services," said Marilyn Carson, associate to the as-

(Continued on Page 90)

DEC Peripherals?

We've got'em!

DEC is a registered trademark of Digital Equipment Corp.

(And we back 'em up.)

We'll get 'em on their way to you within 24 hours. At the right price. In time. On time. Every time. And if you have a problem — you have a no problem return with C & TE.

Peripherals

MK11-BE	DD11-CK	DR11-C	FP11-F	KEF11-AA	MS11-MB
11/04-DC	DH11-AD	DUP11-DA	H775-CA	KW11-K	
ADV11-A	DL11-WB	FP11-A	KDF11-AA	KY11-LB	

Also, RXO2, RLO1, RLO2, RKO7 Disk Drive and Controllers IN STOCK. Call for pricing.

We're The Suppliers. Call us at 904/434-1022.

FREE GIFT!
Order our catalog and receive a deluxe note pad caddy with three highlight markers.
Call 1/800/874-9748.
(In Florida, 904/434-1022.)

UCC COMPUTER & TERMINAL EXCHANGE
A Division of University Computing Company

114 East Gregory Street • Pensacola, Fla. 32501
Distribution centers in major cities.

Stand-Alone CAD/CAM System Ties to VAX

DENVER — A 32-bit stand-alone computer-aided design and manufacturing (CAD/CAM) system has been unveiled here by Auto-Trol Technology Corp.

The Advanced Graphics Workstations (AGW) can reportedly be linked together to form a local-area network with distributed processing power. Also, the network can be connected to a host processor such as Digital Equipment Corp.'s VAX series, according to the vendor.

Each AGW provides a dedicated computer for every user, because each one uses its own 32-bit processor manufactured by Apollo Computer, Inc. Performance is level whether the network consists of two AGWs or 100, a vendor spokesman said.

The local-area networking architecture employs 12M bit/sec baseband transmission. This supports fast transfer and retrieval of data and sharing of resources on the network. In addition, the AGW 's hierarchical communications capabilities allow interfaces to large mainframes such as DEC, IBM and Sperry Univac computers, a spokesman said.

This turnkey system is priced at under $80,000; Auto-Trol is located at 12500 N. Washington St., Denver, Colo. 80223.

Bay Schools Get Good Grades With Recap

(Continued from Page 89)

sistant superintendent of Santa Clara County schools. "Actually, it worked just the other way. Our users came to realize just how much we could save them. Our client base has doubled since 1978, and the end is nowhere in sight."

"In just a few months we had so many new users we were beginning to feel a pinch on the 145," according to David Gomes, assistant director of Recap. "The way things were going, we realized that we didn't have the capability to handle the opening of the 1980 school year."

Though the 4341 already was on order, Recap was forced to lease a larger computer for several weeks from nearby Alameda County. When the 4341 finally arrived, it assumed its new duties in a hurry.

"It literally came up overnight," Gomes recounted. "One Friday we were operating on Alameda County's computer and on our own 145; the following Monday morning all our programs were running on the new system."

The 3705 teleprocessing unit and Systems Network Architecture software began operation later with the installation of IBM 3276 terminals.

One indication of the network's fast growth was the expansion of on-line financial services. The time sheet application started July 1, 1981; accounts payable will come up this July, Gomes said.

"Putting the financial packages on-line will save time and money for everybody," Gomes said. "We figure it'll save upwards of $150,000 in keypunching right in our own data center. The way keypunching costs are escalating, the time will soon arrive when even the smaller districts will save money by going on-line."

Today Recap employs 65 people at its offices in San Jose. It expects to gross $3 million this year by providing data processing services, all on a contract basis.

Variety of Services

There are a wide variety of student services. After purchasing the file creation and maintenance package, cornerstone for all the other reports, schools may choose from external options that include attendance accounting, California guidance history, grade reporting, progress reporting, proficiency assessment scoring, standardized test scoring, scheduling and physical performance survey scoring. The financial reporting side includes payroll, accounts payable and various personnel applications. In almost all available services, users have a choice of processing in batch or on-line mode.

"We've made every effort to structure our rates so that users select teleprocessing," Carson said. "At least 80% of new clients go TP — and many of our long-standing users are converting."

But for a California legislative decision in the late '60s, Recap probably would not exist today in its present form. The lawmakers, recognizing that individual school districts might well need DP services in the future but most likely would be unable to afford their own installations, authorized the creation of 10 regional centers. Most, like Santa Clara County, were already in existence in a limited service mode.

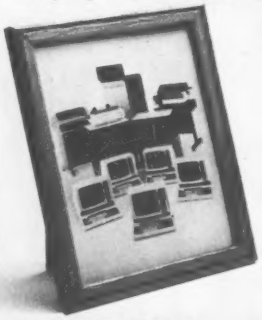
Today a whole new array of word processing and office information is in place. An IBM 8100 handles word processing, which includes formatted letters, arithmetic calculations and a 100,000-word dictionary that checks spellings. The next step: connecting the 8100 to the 4341s and extending the capabilities of the existing office system.

COLOR:

ANOTHER PLUS FROM THE ITT COURIER FAMILY

Color your world more productive!

Color to improve readability. Color to reduce the chance for error. Color to highlight critical data.



Member of the ITT Courier Family. Because our 2790-2A color terminal belongs to the large, diverse ITT Courier family of IBM-compatible controllers, printers and terminals, upgrading or expansion is extremely easy.

These colorful benefits — and complete IBM compatibility — are all yours with our ITT Courier 2790-2A Color Terminal.

Plus, there's a lot more.

There's the assurance of getting color that's field-proven. (Over one thousand 2790-2As are already installed.)

There's ease of installation. The 2790-2A requires no reprogramming. You just plug it in.

There's *no* operator reconvergence. Instead, our color convergence is locked in at the factory.

There's a flicker-free screen to reduce eyestrain. (We eliminate flicker by refreshing every line.)

And there's even more!

Like fast delivery. You can have our colorful 2790-2A in as little as 30 days.

Plus, you get the ability to upgrade. Our system lets you convert easily from BSC to SNA, from 1 to 32 terminals, or from monochrome to color.

So why not add the benefits of ITT Courier color — plus a lot more — to your DP operations. Call today and ask your nearest ITT Courier sales office for all the facts.

Flicker-free screen. We refresh every line to eliminate the flicker problem. Plus we lock in convergence at the factory.

Or, contact the Sales Support Department, ITT Headquarters Marketing

COMPATIBILITY PLUS

1515 W. 14th Street,
Tempe, Arizona 85281
1-800-528-1400 (toll-free)

ITT Courier®

Here's to you, Quadronix!

For ten years of hard labor as the industry's ubiquitous "working tape." For relentless service in the data center. For your consistent level of quality recording. For your reasonable price. And for helping to establish the Wabash reputation for excellence.

As the pioneer of error-free computer tape, you have served the industry well. Your advanced manufacturing process and four-phase testing cycle have lead us to the superior technology we now use to produce G-Tape, the universally adaptable computer tape. Your unique coating process has allowed us to develop our outstanding line of diskette products for the office and home.

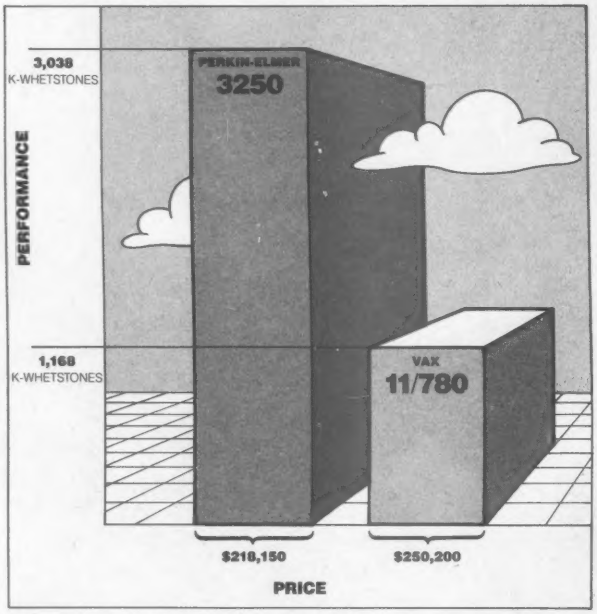
Thank you, Quadronix, from all of us at Wabash and your thousands of customers . . . you've done us proud!

wabash

United States Wabash DataTech, Inc., Two Continental Towers, Ste. 400, 1701 Golf Rd., Rolling Meadows, IL 60008 (312) 593-6363, (800) 323-9868 Telex 9106511800
Canada Wabash DataTech (Canada) Ltd., 3135 Universal Drive, Mississauga, Ontario, Canada L4X2E6 Tel. (416) 625-9533 Telex 06961345
Europe Wabash DataTech (International) Ltd., 43 Redhills Road, South Woodham Ferrers, Chelmsford, Essex, England CM36JF Tel. (STD 0245) 322380 Telex 995455

There are two leaders in 32-bit minicomputers.

We're the one with the new 3250- half the size, twice the speed for 10% less than VAX.



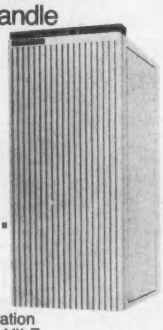
Based on comparable configurations, the new 3250 with FORTRAN VII Z delivers more performance for less money than VAX 11/780.

The new Perkin-Elmer 3250 tops the VAX 11/780 in every critical category: processing power, system capacity and throughput. At prices starting as low as $150,000 with 2MB of memory.

Example: Teamed with Perkin-Elmer's new FORTRAN VII Z—the industry's first universally optimizing compiler—the 3250 yields 3,038 single-precision K-whetstones per second. DEC's VAX 11/780, by comparison, can perform only about 1,200 per second.

Utilizing state-of-the-art 64K RAM technology, the 3250 packs up to 16MB of directly addressable memory in a single 24″ wide x 56″ high cabinet. DEC doesn't offer that much memory in *four* cabinets.

The 3250's dual 32-bit memory bus delivers 40MB/second I/O bandwidth and 64MB/second peak system throughput rate. It can handle up to 115 gigabytes of on-line storage and control over 1,000 I/O devices. VAX, with its single bus architecture, just can't touch these specs.



Looking for a high-performance 32-bit minicomputer? Look to Perkin-Elmer—the company with more installed 32-bit minis than any other company except one. We're the one that gives you more. More performance. More support. More value. Call or send in the coupon today for details on the new 3250. Perkin-Elmer, Oceanport, NJ 07757. Tel: 800-631-2154. In NJ 201-870-4712. **We're the one.**

The Perkin-Elmer Corporation
Marketing Communications
2 Crescent Place
Oceanport, NJ 07757

Please send me complete information on the new 3250 with FORTRAN VII Z.

Name_____ Tel._____

Title_____

Company_____

Street_____

City_____ State_____ Zip_____

CW614

PERKIN-ELMER

Graphics Series Incorporates Bell's Unix, C, Fortran Tools

CHICAGO — Cadlinc, Inc. has introduced a series of desktop graphics computers that reportedly support both traditional stand-alone and host computer environments as well as distributed processing configurations.

The product series, known as the Cadlinc Graphic Computers, incorporates the Bell Laboratories Unix operating system, C and Fortran tools; the IEEE P-796 Multibus standard for flexibility; the Motorola, Inc. 68000 CPU; and Xerox Corp.'s Ethernet networking capability to insure a system growth path, the vendor said.

The graphics computer is being produced in three models, ranging in price from $8,500 to $22,500, the vendor said.

Cadlinc is located at 8600 W. Bryn Mawr Ave., Chicago, Ill. 60631.

Unit Emulates Tektronix 4010

PALO ALTO, Calif. — Tab Products Co. has announced the Tab 132/15G, a graphics terminal.

The unit emulates a Tektronix, Inc. 4010 and is equipped with selected Tektronix 4027 graphics commands. Features include multiple character size, dot-dash lines, point plotting, vector and arc drawing, area fill and selective erase. An enhanced text mode provides text manipulating features including text rotation, proportional spacing and italics, the vendor said.

The unit costs $3,295 from Tab Products, the vendor said from 1451 California Ave., Palo Alto, Calif. 94304.

Workstations Use Unix

SAN JOSE, Calif. — Grinnell Systems Corp. and International Data Services, Inc. (IDS) have unveiled a line of Digital Equipment Corp.-based image processing workstations that use Bell Laboratories' Unix operating system.

Called Grids, the workstations reportedly give users a choice of hardware configurations and one of four DEC computer systems: the LSI-11/23, PDP-11/44, VAX-11/750 or VAX-11/780 systems. The workstations are fully independent devices that are said to reduce dependence on existing mainframe resources. They are geared for use by applications developers, a spokesman said.

A typical system is the Grids 23/1, which uses the LSI-11/23 and combines Grinnell's GMR 274 image processing and display system with the IDS Unixcisor computer. The GMR 274 has three 8-bit image memory banks, a 512 by 512 resolution, four graphics overlays, two zoom and pan controls, a real-time pipeline processor with a 16-bit arithmetic logic unit, a 6-bit video digitizer and an image histograph generator, a spokesman said.

The DEC computer is actually a part of the Unixcisor system, which has 256K bytes of random-access memory, parallel and serial interfaces, a VT100 terminal, 30M bytes of Winchester disk storage, 1M byte of floppy storage and a binary license for the System III Unix operating system.

Other systems are: the Grids 44, which incorporates DEC's PDP-11/44 and Grinnell's GMR 270 series image processing display system, and the Grids 750 and 780 systems.

The systems typically cost about $43,000, depending on the user's configuration, the spokesman said from the firm at 2159 Bering Drive, San Jose, Calif. 95131.

'Idea 1000' Targets Engineers; Based on 32-Bit Nodal CPU

PORTLAND, Ore. — Mentor Graphics Corp. has announced the Idea 1000, a computer-aided engineering system based around the Apollo Computer, Inc. 32-bit nodal processor.

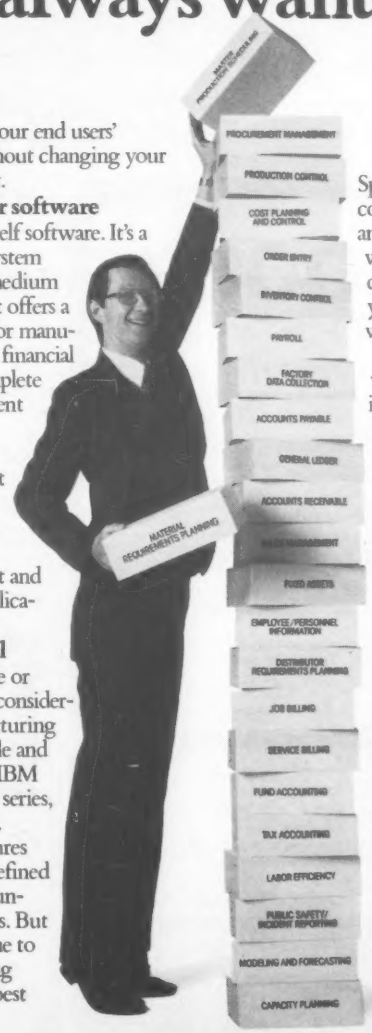
The system allows engineers to design and document digital logic used in printed circuit boards, very large-scale integration circuits, thick and thin film devices and gate arrays. It comes with a set of interrelated applications programs that work with a companion data base management system and data base facilities.

The applications programs include structured and logic design, interactive logic simulations, project communications, document preparation, outputs and programming tools.

A typical system will use three to 10 Apollo workstations. Each is an integrated CRT terminal and 32-bit processor with 3.5M bytes of main memory and up to 66M bytes of Winchester disk storage.

The Idea 1000 costs $83,000/station for a typical four-station network and $69,000/station for a 10-node system. Customer deliveries of the system will begin in October, Mentor said from Suite G7, 10200 S.W. Nimbus Ave., Portland, Ore. 97223.

Now you can do things with your IBM computer that you've always wanted to do.



Things that will solve your end users' problems. And yours. Without changing your existing IBM environment.

Your hardware, our software

Spectra is our off-the-shelf software. It's a fully-integrated, on-line system developed by Xerox for medium to large IBM computers. It offers a full range of applications for manufacturing, distribution and financial functions. As well as a complete line of software management support systems.

With Spectra, you can avoid years of development and have a system up and running in a few months. You simply phase it into your existing environment and start cleaning up your applications backlog.

You stay in control

Spectra is ideal for single or multi-plant environments considering a closed-loop manufacturing system. It's fully compatible and upgradable with installed IBM CPUs as small as the 4300 series, all the way up to the 3081.

It's proven, too. Its features have been enhanced and refined through years of use by hundreds of satisfied customers. But that's not all. We'll continue to update the system, ensuring that you always have the best software available.

Two ways to get there

You can get the benefits of Spectra by using it on your IBM computer immediately. Or, as an option, start with the same software on our on-line, remote computer services. Then, when you're ready, just move the software and data base in-house.

We'll get you up and running with a comprehensive training and implementation program. After that, we'll always be on hand to help in any way we can.

To find out more about Spectra software, call toll-free (800) 323-2818, Operator 146. In Illinois, call (800) 942-1166.

Or return this coupon. We'll mail you our new *Spectra Capabilities* brochure. And you'll be on your way to doing the things you've always wanted to do with your IBM computer.

Xerox Computer Services
c/o Ron Rich, 5310 Beethoven Street
Los Angeles, California 90066

Send me your *Spectra Capabilities* brochure.
My company is a:
☐ Manufacturer ☐ Distributor
I'm interested in your software for:
☐ IBM 43XX ☐ IBM 370 ☐ IBM 30XX

Name/Title _____
Company _____
Street _____
City _____ State _____
Zip _____ Tel. ( ) _____

C6/14

XEROX® and Spectra are trademarks of the XEROX CORPORATION.

XEROX

Letter Perfect Printer Doubles as Data Cruncher.

Print two ways—correspondence quality and high speed. Now priced under $2000!

The new MT-1800 dual purpose serial printer uses a unique 40x18 matrix dot pattern for high quality correspondence printing. Flip a switch and it uses a 7x9 matrix for high speed data processing printing with throughput rates up to 200 lines per minute.

It's the latest evolution in the T-1000 family of high reliability, operator-friendly printers. Ask your Mannesmann Tally dealer for a demonstration or return the coupon for our literature.

MANNESMANN TALLY

8301 S. 180th, Kent, WA 98031
Phone: (206) 251-5524.

Name _____
Company _____
Address _____
City/State _____
Zip _____ Phone _____ CW

HP 3000
HARDWARE AND SOFTWARE

- **HP HARDWARE AND SYSTEM SOFTWARE** sold by DSI and installed and fully supported by Hewlett-Packard.
- **SUCCESS-PROVEN APPLICATION PACKAGES** sold by DSI and installed and supported by their developers, Data Systems for Industry and Hewlett-Packard at over 40 DSI sites.
- **FIXED PRICE AND SCHEDULE** with hardware-software discounts and leasing available to qualified customers.
- **INTERNATIONAL SUPPORT FROM OFFICES IN—**

Los Angeles Chicago Europe

ACCOUNTING
- Payroll, Personnel
- Labor Distribution
- Accounts Receivable
- Accounts Payable
- Fixed Assets
- General Ledger

INTEGRATED MANUFACTURING
- Order Entry
- Material Requirements Planning (MM/3000)
- Inventory Control
- Shop Floor & Capacity Control
- Job Cost Reporting

DISTRIBUTION
- Order Entry
- Multi-Warehousing
- Shipping—Billing
- Accounts Receivable
- Replenishment Planning
- Distributed Processing

DISCOUNTS AND LEASING
- Up to 24% volume discounts on HP hardware-software systems sales
- Leasing available for hardware-software system sales

DATA SYSTEMS for INDUSTRY
3450 E. Spring Street, Long Beach, CA 90806
(213) 595-8741

Bits & Pieces

Zeta's Intelligent Plotter Boasts High-Speed Ability

CONCORD, Calif. — Nicolet Zeta Corp. has introduced a high-speed plotter that features windowing, programmable pause, electronic margin limits, next plot and grid scaling.

The Zeta 3610 Intelligent Plotter provides a speed of 20 in./sec (on axis), a .025mm resolution and a 2g acceleration. The unit's drum size is 36 in.

The plotter costs $25,900 with the firm's integral C53 controller, or $23,900 without it. Nicolet is located at 2300 Stanwell Drive, P.O. Box 4003, Concord, Calif. 94524.

Micrographics Congress Distributing Source Book

WASHINGTON, D.C. — The International Micrographic Congress (IMC) is distributing its 1982-83 *International Micrographics Source Book*, which lists:

- Names and addresses of manufacturers, distributors, micropublishers, consultants, dealers and bureaus.
- A keyword index to 200 product categories.
- A calendar of forthcoming events.
- An index of dealers and the products they market.
- Other information on micrographics.

The 360-page book is indexed and softbound. It is available for $60 from IMC, Publications Sales, P.O. Box 34404, Bethesda, Md. 20817.

Uninterruptible Power Line Announced by Tab Products

PALO ALTO, Calif. — Tab Products Co. has announced the Power Wardens line of uninterruptible power systems.

The units are offered in three output sizes: 2.0-, 2.5- and 3.0KVA, the vendor said.

A 2.0KVA unit costs $3,295, the 2.5KVA unit costs $3,795 and the 3.0KVA version costs $3,995. The vendor is located at 1451 California Ave., Palo Alto, Calif. 94304.

Distribution Unit Unveiled For Noise-Free AC Power

SAN DIEGO — Topaz, Inc.'s Distributed Data Processing Division has announced a power distribution system for distributing noise-free ac power to computers and peripherals.

The Powercenter Power Distribution System reportedly provides a minimum of 146 db attenuation of common-mode noise and more than 40 db attenuation of transverse-mode noise.

Prices for the 30- to 100-kVA units start at $8,850 from 3855 Ruffin Road, San Diego, Calif. 92123.

Color Graphics Controller Has Extended Applications

HILLSBORO, Ore. — Metheus Corp. has announced a color graphics controller in its 400 series said to feature extended applications capability over previous models.

The Model 440 reportedly increases the number of bit planes from four to eight, adds selective blink, expands the color look-up table and offers a choice of refresh options.

The Model 440 costs $16,400 from the firm at P.O. Box 1049, Hillsboro, Ore. 97123.

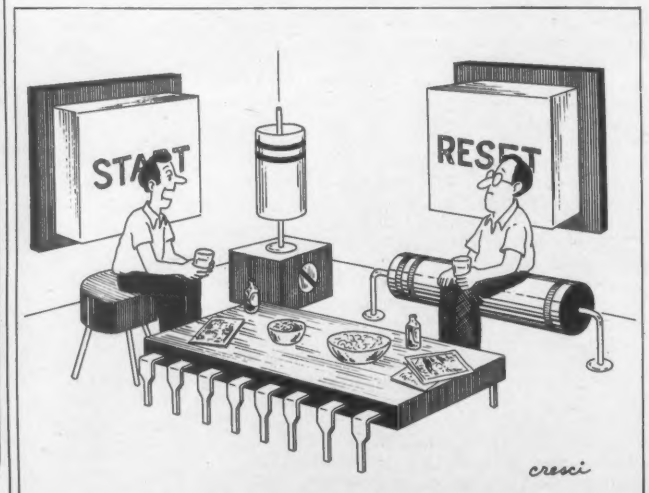
CAD Applications Gain Colored Graphics Micro

ST. CLAIR SHORES, Mich. — Applied Systems Corp. (ASC) has released a color image/graphics microprocessor-based system with image and text processing features for applications in computer-aided design.

The system includes Intel Corp.'s 8085/8088 dual microcomputers for image analysis and digital array processing, the vendor said. System programs can be executed on both microcomputers and control can be toggled between the processors for software optimization. The system is said to be software compatible with the 8086 and includes three RS-232 ports.

Optional features are said to include peripheral I/O adapters for color cameras/scanners, three-dimensional graphics displays, joysticks and light pens, digital plotters, laser printers, projection TVs, system consoles, automation controls, CATV networks and data transmission.

The image/graphics system is priced at $15,000 from ASC at 26401 Harper Ave., St. Clair Shores, Mich. 48081.



'Making My Own Furniture Helps Me Get Away From Electronics For Awhile

You have the information. We have the way to move it.

It's extraordinary how far American business has gone in managing information in the office.

And how frustrating it can be to get that information where it's needed, once it leaves the office.

Your computers, for example, can swap data with each other.

But if you need to transmit that data to less sophisticated or incompatible equipment, you can't.

It seems clear that something must be done to bring the delivery of information outside the office to the same sophisticated level as inside the office.

Which is precisely what we at ITT Worldcom are doing now with our Spectrum of Communications Services.

To put it simply, our Spectrum is a new range of worldwide information delivery services. We've created it specifically to bring together the latest advances in data and record communication.

And it was created with the same expertise and quality that millions of people around the world have come to expect from us.

So, returning to our example, your computers and terminals are now able to talk to any other terminals, anywhere in the world. Even those on other networks.

You can even deliver the same information to an unlimited number of terminals, automatically.

And we're continually adding new service features to our Spectrum with an eye to satisfying your future requirements.

The way we look at it, whatever other productivity problems American business has, it's producing more and more information.

And getting that information where it's needed—speedily, reliably, efficiently and economically—that's what ITT Worldcom is all about.

I'd like more information. C-6
Please send me your brochure.
Name_____
Title_____
Company_____
Address_____
City_____ State_____ Zip_____
Marketing Department (A/PR)
ITT World Communications Inc.
67 Broad Street
New York, New York 10004

ITT

The Communications Spectrum. From ITT World Communications Inc.

TeleVideo's Multi-User Breakthrough: The TS 806 – Full Throughput, File Sharing, True Multi-Tasking – Each Station Is a Computer

Let TeleVideo put a team of computers in your office to handle your data and word processing requirements. TeleVideo's new TS 806 multiple-user small business computer features a unique multiple CPU architecture which makes processing power, files, programs – all the system's capabilities – available at every work station.

As each work station is a computer itself, there is no loss of throughput or contention for processing power that is typical of single CPU systems.

The TS 806 can accommodate up to six users. And TeleVideo's true multi-tasking capabilities allow each station to do its own work at the same time other jobs are done at other stations.

TeleVideo's TS 806 – a solution to your small system needs – today and tomorrow.

Compare these TeleVideo TS 806 Features

Features	Benefits
Two serial ports at each work station	Printer or telephone communications modem can be added as required.
CP/M® 2.2 for work station program execution	Industry standard software. Hundreds of available programs.
Z80A based architecture	Fast data storage and retrieval.
9.6 Mbyte hard disk (unformatted)	Large storage capacity allows sophisticated software and voluminous files. Approximately 6,000 pages of text. (Add on tape and disk storage is available.)
Nationwide TRW Service	On-site and depot service is conveniently available.

For more information, call the TeleVideo sales office listed below.

TeleVideo Systems, Inc.®

TeleVideo Systems, Inc. • 1170 Morse Avenue • Sunnyvale, CA 94086

Eastern Region – (212) 308-0705 • Northeast Region – (617) 369-9370 • Midwest Region – (312) 969-0112
South Central Region – (214) 258-6776 • Southwest Region – (714) 752-9488 • Northwest Region – (408) 745-7760
Southeast Region – (404) 447-1231 • European Sales – (31) 075-28-7461 TLX: 844-19122 (TLVDO NL)

Firms Offer 16-Bit Dual-Processor Systems

Zenith's Z-100

• *Zenith Data Business Line Features Two Operating Systems*

PEORIA, Ill. — Zenith Data Systems last week unveiled a line of business computers that incorporate both an 8-bit and a 16-bit processor and have two operating systems, allowing them to use a variety of software programs.

The Z-100 Series contains both an Intel Corp. 8085 to handle existing 8-bit software and an 8088 for 16-bit programs.

The systems also use a variation of Microsoft, Inc.'s MS-DOS operating system, called Z-DOS and come equipped with Digital Research, Inc.'s CP/M-85. The former can run the same applications slated for IBM's Personal Computer, while the latter is compatible with programs created on current Zenith computer systems, a spokesman said.

A standard Z-100 has 128K bytes of random-access memory that can be expanded by 64K bytes through an open socket on the CPU board. It also features two 320K-byte disk drives and a built-in keyboard with 12 function keys, cursor control keys and a numeric keypad. In addition, the system has two serial ports, a Centronics-compatible port, and a socket for a light-pen data entry device, the spokesman added.

The system is presently available in two versions: an inte-

(Continued on Page 100)

• *Hard-Disk-Based Micro System Handles Six I/O Devices*

The IST 86

INDIANAPOLIS — Interactive Systems Technology, Inc. (IST) has introduced a hard-disk-based microcomputer system that can handle up to six terminals or peripheral devices.

The IST 86 is a dual-processor system that incorporates two 16-bit processors: an Intel Corp. 8086 main processor and an Intel 8089 I/O processor. The main processor handles user programs and can directly address up to 1M bytes of main memory. The system or I/O processor (IOP) controls disk and tape units as well as serial ports. It also serves as the system's direct memory access controller. The IOP reportedly has two independent channels and incorporates a communications subsystem that consists of six high-speed serial ports, a spokesman said.

The system includes a 15-in. high-resolution CRT display, a detachable keyboard and a 10M-byte Winchester disk drive. It also has a 6.25M-byte tape cartridge drive for backup and a minimum of 128K bytes of error-correcting memory. The disk system has an average access time of 25 msec and a maximum access time of 50 msec. The physical disk can be used as either a single 10M-byte drive or two 5M-byte logical units, the spokesman claimed.

The system's keyboard has 83 keys and is connected to the processor via a three-foot coiled cable. It has an 18-key numeric pad with four user-definable function keys, five cursor con-

(Continued on Page 100)

• *Vector 4 Offers T/S Memory, Boasts 64K-Bit Chip Technology*

PALO ALTO, Calif. — A dual-processor microcomputer system that is compatible with both 8-bit and 16-bit software, incorporates 64K-bit chip technology and offers a time-shared memory system has been announced by Vector Graphic, Inc.

The Model 4 uses both a Zilog, Inc. Z80 and an Intel Corp. 8088 microprocessor and comes in two versions: the 4/20, which is a dual floppy disk drive system with 630K bytes of storage, and the Model 4/30, also a dual disk drive system, but with a 630K-byte floppy and 5M-byte Winchester drive.

The firm designed the system with two types of processors to take advantage of the vast amount of 8-bit software currently available and to include the inherent speed of the 16-bit

(Continued on Page 100)

The Vector 4

THERE'S ALWAYS ROOM FOR ANOTHER VIEWPOINT

VIEWPOINT

For End Users:
The ADDS computer display terminal any business person can afford. In fact, you could own *three* of our terminals with full-size, two position tilt screens, moveable typewriter-like keyboards—all in a smaller, space-saving cabinet—for the price of two ordinary terminals.

VIEWPOINT/3A *PLUS*

For End Users:
Offering the same reliability as the original Viewpoint—and at the same list price—our 3A *PLUS* is also compatible with the Lear Siegler ADM3A and other competitive terminals.

NOW, VIEWPOINT/60

The smart editing terminal you have been looking for. With its small size, moveable keyboard, elaborate visual highlighting, programmable function keys, and line drawing graphic mode, it is the *lowest cost product* offering these outstanding features. It *also offers a migration path* from ADDS' *Regent**60 and 40.

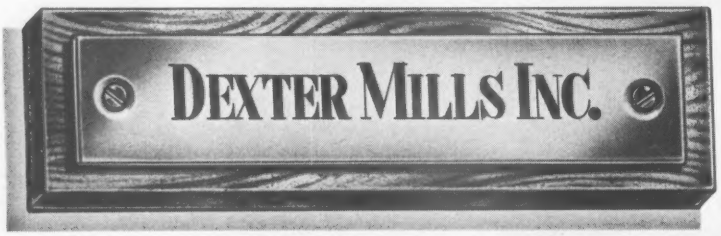
SOMETHING EXTRA IN EVERYTHING WE DO

ADDS
Applied Digital Data Systems Inc.

For more information, call or write: Applied Digital Data Systems Inc., 100 Marcus Blvd. Dept. MCV, Hauppauge, N.Y. 11788 (516) 231-5400

**Regent* is a registered trademark of Applied Digital Data Systems Inc.

THE UPW
MOBILE CO



Upward mobility, the ability to move up a peg or two, is an important part of the American dream.

But it can also turn into an American nightmare.

Especially for a small businessman who's laid out a lot of his hard earned money for a computer he's outgrown and for application software that no longer applies.

And we don't have to tell you what a nightmare it can be for the guy who has to rewrite all that software for that businessman.

You.

The Commercial Systems Supplier.

Well, now Data General, a company that supplies systems to 82 of the Fortune 100 Companies, has rewritten that scenario.

With the new Data General Commercial Systems Family.

Like any family, ours starts out small. The CS/5 is a single terminal desktop computer, fully capable of handling all the applications a small business requires. From these not so humble beginnings, we move up to a small business system, the CS Series 100, that can support from 2 to 9 terminals and do things like billing, inventory

WARDLY OMPUTER.

and word processing simultaneously. Finally we grow into a high speed multi-function business system (CS Series 200) with the ability to handle up to 25 terminals.

Yet with all this moving up, there's very little moving out. For these systems are compatible and require a minimum of replacement.

Likewise, the application programs that run on the CS/5 run unchanged on the CS Series 100, on the CS Series 200 and on up through Data General's most sophisticated information systems.

So a business can use the same software as it goes from small to medium to large.

Without retraining its people. Or changing its methods.

And you can install the same software as you go from small to medium to large businesses.

Without rewriting or redocumenting.

For unlike people, the Data General Commercial Systems don't start speaking a different language as they grow.

Interactive COBOL and Business BASIC are spoken here. From our smallest operating system through our largest.

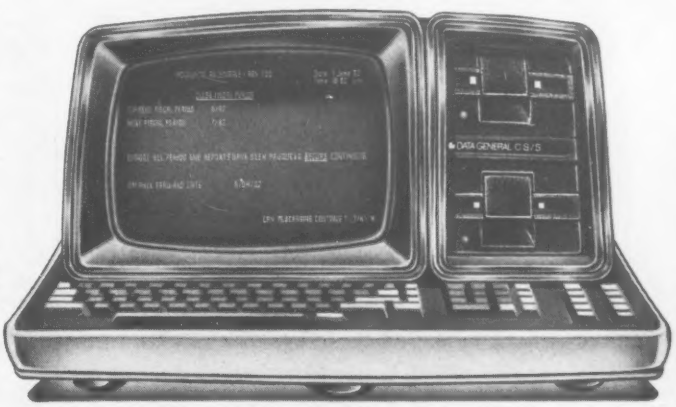
And just in case we have to draw you a picture, new Business BASIC software packages, (the BUSI Series) are now capable of creating business graphics, from pie charts to eye charts (BusiPEN),™ word processing (BusiTEXT),™ and a program/report generator (BusiGEN).™*

So, what you have here is a system that beats the system. With the latest hardware, software and support services, it optimizes your development time, your software investment and your customer's money.

Which might just make you upwardly mobile, too.

In which case, maybe we can interest you in a Commercial System.

*On the CS/5 only BusiTEXT is currently available.



Data General

We engineered the anxiety out of computers.

SPECIAL OFFER TO CLASSIFIED ADVERTISERS IN

COMPUTERWORLD/MEXICO

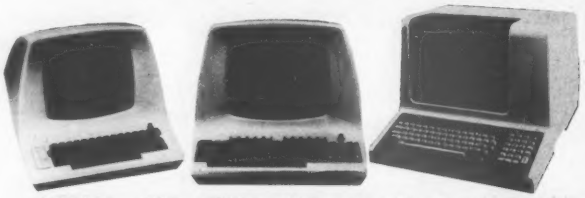
The Hottest New Newspaper in the Hottest Computer Market!

Looking for a new market for equipments, services, software or used computers?

Thirty thousand readers of this Mexican newspaper are looking for you.

Come together at $1.90 per agate line on a 5 column page like this one (minimum 30 lines/one column).

Write or call: Alicia Lavastida.
Computerworld/México Oaxaca 21-2 México 7, D.F.
Tels: (905)549-3139 514-3219. We'll translate your ad for $5.00/page -- and set type free.



ADM-3A...$595 ADM-5...$645 Hazeltine Esprit...$575

Not so dumb! 3 great video terminals for under $650.

MTI has them in stock, ready for delivery.

They keep making these dumb terminals smarter and cheaper. The Hazeltine Esprit and the Lear Siegler ADM-5 are both buffered terminals and have editing keys. And even the ADM-3A comes with a lot of performance extras like complete cursor control and RS-232C extension port.

At these prices it makes good dollars and sense to take your pick of one of these not so dumb video terminals.

MTI is the one source for all the terminals, peripherals, applications expertise, maintenance and service you'll ever need. And whether you buy, lease or rent, you'll find our prices hard to beat. Call today.

New York: 516/621-6200, 212/767-0677, 518/449-5959
Outside N.Y.S.: 800/645-6530
New Jersey: 201/227-5552
Ohio: 216/464-6688

mti systems corp

Applications Specialists & Distributors, New York, New Jersey and Ohio.
Intel, Texas Instruments, DEC, Dataproducts, Lear Siegler, Hazeltine, Diablo, Racal-Vadic, Digital Engineering Retro-Graphics, Cipher, Priam, SMS, Able Computer, Elgar and 3Com.

ADM-3A and ADM-5 are trademarks of Lear Siegler Inc.
Esprit is a trademark of Hazeltine Corporation.
MTI is an Authorized Distributor for both Lear Siegler and Hazeltine.

Molecular Supermicro 8, 32 Get 16-Bit Processing

SAN JOSE, Calif. — Molecular Computer Corp. is now offering 16-bit processing on its Supermicro 8 and Supermicro 32 systems.

The 16-bit capability, based on Intel Corp's 8086 microprocessor with up to 1M bytes of memory, can co-exist in the same system with Zilog, Inc.'s 8-bit, Z80A microprocessor, functioning under Molecular's proprietary CP/M-compatible N/Star operating system, according to the vendor spokesman.

The N/Star network operating system is said to be compatible with both CP/M-86 and CP/M, the vendor said. Molecular's 16-bit capability includes up to 1M bytes of random access memory (RAM) in 256K-byte increments, an Intel Corp. 8089 I/O direct-memory-access processor, an 8-MHz clock and parity for error detection, according to the vendor.

Supermicro Prices

The Supermicro 8 and 32 with a 16-bit processor with 256K bytes of RAM are both priced at $1,495, according to the vendor.

A single-user Supermicro 8 with a Z80A 8-bit microprocessor, 64K bytes of memory, 10M bytes of Winchester 5¼-in. disk storage and 8-in. floppy disk drive is priced at $7,995, the vendor said.

The Supermicro 32 with 32M bytes of 8-in. Winchester disk storage and a 20M-byte tape backup unit as standard equipment is priced at $17,995, the vendor said.

Further information on the Supermicro 8 and 32 can be obtained from Molecular Computer, which is located at 1841 Zanter Road, San Jose, Calif. 95112.

Graphwriter II Unveiled

WALTHAM, Mass. — Graphic Communications, Inc. has introduced Graphwriter II, an enhanced version of the vendor's Graphwriter I, a stand-alone business graphics system.

The system uses the Hewlett-Packard Co. HP-87 microcomputer and an 8-pen plotter according to a vendor spokesman.

Its features include 40 formats and bar, line and pie charts, the vendor said.

The system allows for mainframe communications and includes the Digital Research, Inc. CP/M operating system. It is said to allow a non-technical operator to produce business graphics, according to the vendor spokesman.

The complete system sells for $19,800 from Graphic Communications, which is located at 200 Fifth Ave., Waltham, Mass. 02254.

Vector 4 Offers T/S Memory

(Continued from Page 97)

chip. The 8088, under an extended version of Digital Research, Inc.'s CP/M operating system, reportedly handles disk transfers at up to four times the speed of a single 8-bit processor, a spokeswoman noted.

In addition to the dual processors, the Vector 4 includes 128K bytes of random-access memory, expandable to 256K bytes. Memory mapping logic reportedly allows the Z80 to access entire memory in increments as small as 2K bytes.

The system's memory is time-shared between the CPU and the CRT controller, which is said to allow fast access to screen memory for high-resolution graphics. It also allows the screen memory to be moved anywhere in main memory, the spokeswoman said.

The Model 4 has three S-100 card slots for adding communications interfaces, peripherals controllers or other specialized I/O boards. The system also has a high-resolution graphics capability, featuring four to 16 levels of gray scale. Graphics are displayed on a green phosphor screen.

Finally, the system can generate standard red, green, blue color signals to drive a color monitor and it has a programmable tone generator with speaker.

The Model 4/20 costs $4,495 while the high-storage-capacity Model 4/30 is priced at $5,995.

Vector Graphic is located at 500 N. Ventu Park Road, Thousand Oaks, Calif. 91320.

IST System Handles Six Units

(Continued from Page 97)

trol keys and eight system- status indicators, the spokesman noted.

The system is geared for such standard business applications as general ledger, accounts receivable, payroll, inventory or word processing; runs under Digital Research, Inc.'s MP/M multitasking operating system; and can be programmed in Cobol, Fortran, Basic, PL/I and Pascal.

The IST 86 costs $12,950 for a basic package with 128K bytes of memory, the spokesman for the firm said from Suite 11, 5259 N. Tacoma Ave., Indianapolis, Ind. 46220.

Zenith Data Business Line Out

(Continued from Page 97)

grated model that has a built-in monochrome CRT display; and a compact version that features an external CRT monitor, according to the spokesman.

Although prices for the Z-100 were not available at press time, a spokeswoman for the firm said the system will be priced competitively with other 16-bit computer systems. The price will fall somewhere under $5,000. It is also available in kit form, the spokesman said.

Deliveries of the system are scheduled for this September from the firm at 1909 E. Cornell, Peoria, Ill. 61614.

Hazeltine announces Esprit II.™

The class of the economy terminals just got classier.

The looks and performance of Hazeltine's new Esprit II™ are so classy you won't believe its economical price. In fact, if you shop around, we think you'll find it's the highest performance terminal in the low price market.

Esprit II offers the ergonomic features that operators appreciate most. It has a detachable keyboard for convenient location within the work area. And it has a tiltable display that easily adjusts to the most comfortable viewing angle.

Like our first Esprit, it offers the best quality display image. In addition, it has editing features and function keys you won't find in any other competitively priced terminal. And it's built with the same proven reliability as the original Esprit that carries one of the most comprehensive warranty protection packages in the industry.

So compare prices! Compare performance! Then call your Hazeltine distributor and ask for a demonstration.

After all, if you're going to buy an economy terminal, go first class.

$595
Esprit

$645
Esprit II

Hazeltine Corporation
Computer Terminal Equipment
Greenlawn, NY 11740
(516) 549-8800, or call toll free:
800-645-4508

Esprit II.™

Editing terminals at conversational prices.

See us at COMDEX Booth #548

Winchester-Type Disk Drive Boasts 25-Msec Access Time

LEXINGTON, Mass. — An 8-in. Winchester-type disk drive featuring 25-msec access time has been announced by NEC Information Systems, Inc.

The D2246 is said to have 85M bytes of storage capacity and interface/format compatibility with storage module device-type controllers. The single-unit price is $5,000, a spokeswoman said from 5 Militia Drive, Lexington, Mass. 02173.

Intelligent Workstation Based on Motorola 68000

BEDFORD, Mass. — Bedford Computer Systems, Inc. has announced the Meteor, an intelligent terminal workstation based on the Motorola Corp. 68000 microprocessor.

Mini Bits

The unit can be used as a word processor or as a graphic artist's workstation for creating book and magazine illustrations. Features include full pagination for all types of printed material, the vendor said.

The unit costs from $8,700 the vendor said from Tillell Road, Bedford, N.H. 03102.

SSM 32K-Byte Memory Board Out; MB64's Price Reduced

SAN JOSE, Calif. — Recent reductions in the price of memory chips have allowed SSM Microcomputer Products, Inc. to cut the price of its 64K-byte memory board. The firm also announce a 32K-byte board.

The MB64 is now $599, a 20% reduction from its previous price of $749. The board is configured with two 32K-byte blocks of random-access memory and up to 8K bytes of erasable programmable read-only memory.

The newly announced MB32 reportedly can be upgraded to a maximum of 64K by plugging in additional 2K chips. The MB32 board costs $425 from the firm at 2190 Paragon Drive, San Jose, Calif. 95131.

Cartridge/Tape Controller Out for Multibus Systems

CHAMPAIGN, Ill. — Central Data Corp. has announced a Winchester cartridge/tape controller for Intel Corp. Multibus systems.

The controller works with Intelligent Memories, Inc. disk drives and Data Electronics, Inc. streaming tape drives. The board functions under the firm's Zmos operating system and can be configured on any multibus system, the vendor said.

The controller board costs $450, the vendor said from 1602 Newton Drive, Champaign, Ill. 61820.

Interface Supports Display, Graphics for Apple II

ARLINGTON HEIGHTS, Ill. — Amdek Corp. has announced an interface for Apple Computer, Inc. Apple II processors to support high-resolution graphics and an 80 by 24 character display.

Called the DVM, the unit consists of two printed circuit boards that can be plugged into the Apple II's I/O bus. The unit does not interfere with the normal operation of the Apple II and does not affect software compatibility, the vendor said.

The unit costs $199, the vendor said from Suite E, 2420 E. Oakton St., Arlington Heights, Ill. 60005.

Magnetic Tape Subsystem Released for Apple II, III

SAN DIEGO, Calif. — Innovative Data Technology, Inc. has announced a magnetic tape subsystem for Apple Computer, Inc. Apple II and Apple III processors.

Configured in a ½-in. format, the SCDR-10500 tape drive features IBM, Ansi- and ECMA-compatible hardware and software for Apple processors. The tape subsystem allows Apple users to communicate with IBM and compatible processors using 9-track NRZI-800 char./in. or 1,600 char./in. magnetic tape, the vendor said.

A single 1,600 char./in. subsystem costs $8,500. Additional daisy chain drives cost $4,250 each, the vendor said from 4060 Morena Blvd., San Diego, Calif. 92117.

Memory Board Introduced For IBM Personal Computer

SANTA ANA, Calif. — Vista Computer Co., Inc. has introduced a memory board for the IBM Personal Computer that allows up to 576K bytes of storage.

The Maxicard uses one slot and reportedly allows the user to populate any and all 64K blocks between 64K and 640K.

The board uses industry standard 64K random-access memory, runs at full speed with no wait states and contains on-board parity bit on each byte. The Maxicard costs $1,849, the vendor said from 1317 E. Edinger Ave., Santa Ana, Calif. 92705.

Removable Disk Subsystem Fits IBM Personal Computer

LAGRANGE PARK, Ill. — BC Systems, Inc. is offering a 20M-byte removable disk subsystem for the IBM Personal Computer and other S-100-based microcomputer systems.

The subsystem consists of two 8-in., 10M-byte floppy disk drives with start/stop times of 4 to 5 sec. The data transfer rate is 1.13M byte/sec with an average seek time of 35 msec.

The dual-drive subsystem, available July 15, costs $6,895 from the firm at 1016 31st St., LaGrange, Ill. 60525.

THE ANN ARBOR AMBASSADOR™ 300

Why settle for an emulation when you can have an AMBASSADOR 300?

	AAA 300	DEC*VT100*		AAA 300	DEC*VT100*
Display Lines	60	24	Send/Print Controls	12	0
Screen Size	15"	12"	Send/Print Modes	30	0
Cursor Controls	22	15	Operator Convenience Mode	24	10
Graphic Renditions	6	5	Programmable Keys	48	0
Tab Controls	12	4	Line Drawing	Yes	Yes
Erase/Edit Controls	25	4	Non-Volatile Setup	Yes	Yes
Form-Filing Controls	10	0	Non-Volatile Control String	Yes	No

The Ann Arbor Ambassador 300 supports most of your VT100* software *without* asking you to give up other features you'll like. Its selectable 60-line display lets you see more of your program or report. And you still get all the capability of the standard Ambassador. Things like editing, formatting, printer output and programmable function keys.

For more information, call Ann Arbor Terminals at (313) 663-8000.

*DEC and VT100 are trademarks of Digital Equipment Corporation.

ANN ARBOR 6175 JACKSON ROAD • ANN ARBOR, MICHIGAN 48103 • TEL: 313-663-8000 • TWX 810-223-6033

Commterm Digitized System Handles Voice Messages

BURLINGTON, Mass. — Commterm, Inc. has unveiled a digital voice store-and-forward system said to let users automatically and remotely control the access, location and disposition of their telephone messages.

With the Electronic Voice Exchange (EVX), users can pick up messages; repeat, save or cancel them; order a hard-copy transcription; or transfer them to someone else, the vendor claimed.

A CPU is at the heart of the system and voice messages are stored on a disk drive for immediate retrieval or long-term storage.

An installed EVX system designed to handle 1,500 users costs about $130,000, according to a Commterm spokesman.

Commterm is headquartered at 10 Third Ave., Burlington, Mass. 01803.

Report: Copier Sales, Not OA Line, Remain Key to Profits at Xerox

By Bruce Hoard
CW Staff

NEW YORK — Despite its heralded plans to offer a complete line of office products, Xerox Corp. still derives over 90% of its operating profits from copiers, according to a recent report from Northern Business Information, Inc. (NBI).

"Xerox: A Strategic Analysis," maintains the company's main project since the early '70s has been to reduce its dependence on copier sales because the market for stand-alone copiers is shrinking. NBI predicts the decline will begin by the end of the '80s.

The diversification that began in the late '60s has been slowed by the company's failure in mainframe computers in the mid-'70s and early failures in the word processing market, the report claims.

Xerox' plan from the outset was to fund its diversification project with earnings from its copier business. However, that strategy is being frustrated by "increasingly fierce competition" in the plain-paper copier market.

NBI estimates that Xerox' share of the U.S. copier market fell from virtually 100% in 1970 to 43% in 1981. It also claims the company's operating margins fell from 29.9% over the same time period.

"Xerox' early failures in office automation and the decline in profitability in copiers has forced management to rethink its strategy," the report notes. "One result has been a restructuring of Xerox' organization."

Those changes have included emphasis on decentralization to "bring decision making closer to the marketplace." Another major goal is to get costs down to improve profitability. Technologically, Xerox has introduced a flurry of OA devices with the intent of gaining leadership in OA as well as copiers.

In office automation, its strategy is predicated on turning placements of its Ethernet local-area network into sales of workstations and peripherals. Company officials see the attachments, rather than Ethernet itself, as the real money earners.

A corollary of that strategy is emphasizing automation for office professionals and executives, since Xerox studies have shown salaries for those two

(Continued on Page 104)

Electronic Mail Package Runs on Commputer CPU

BEAVERTON, Ore. — Computer Development, Inc. has unveiled an electronic mail software package for its Commputer communications processor which is said to offer additional networking capabilities.

The Commail package features electronic mail with a comprehensive telephone directory, a word processing capability for message preparation and editing and a menu-driven terminal communications control system, the vendor claimed.

All routines are automatically linked together for communications on Z80-based systems (other versions are available on request), according to the vendor spokesman.

Commail can employ standard Ascii character transmission, allowing normal Ascii text and verified text, programs, data or encrypted files to be mailed over phone lines.

The package provides 24-hour-a-day service, automatically transmitting files at selected times, receiving messages from any other connected system and logging all incoming and outgoing message activity, the vendor said.

It costs $495 from Computer Development at Suite 200, 6700 S.W. 105th, Beaverton, Ore. 97005.

OA Technology — Part 2

Home Users Seen Bulk of CBMS Market

By Bruce Hoard
CW Staff

OTTAWA — There are currently 125,000 computer-based message service (CBMS) mailboxes in the U.S. receiving 60 million to 80 million messages a year, according to Stephen A. Caswell, president of Network Innovation, a Canadian consulting firm here.

Home users of this form of electronic mail are the most numerous, sending and receiving about half the total traffic through such service bureaus as Compuserve and the Source. Texas Instruments, Inc. has more corporate mailboxes than any other company, with approximately 12,000, he added.

Caswell, who is also editor of *Electronic Mail & Message Systems*, explained CBMS uses store-and-forward technology to send messages through packet-switched networks. The packet-switching networks use multiplexers to condense many messages into one line.

Off-the-Shelf Packages

Larger companies seeking electronic mail commonly turn to such companies as BBN Information Management Corp. and Dialcom, Inc. for their needs, he said. Buying those packages makes more sense than developing one in-house, unless there are specific and rigid protocol needs to be met.

"Anybody that would go and build their own package would have to be crazy," the editor observed.

Asked about the value of computer-based electronic mail packages offered by hardware vendors, he said they were limited by their inability to handle large numbers of simultaneous users. However, he added they are improving and well-suited to closed networks.

This is the second in a series of articles reviewing various office automation technologies. This week, a look at electronic mail. In the June 28 issue, a look at voice store-and-forward systems.

Most CBMS packages of the service bureau variety share several common features, according to Caswell, who developed Bell Canada's Envoy 100 package. Sending options include "urgent," which sends the message to the top of the recipient's queue, and "registered," which prompts a return message.

Receive options include automatic reply and file forward. Editing options are also found on most of these systems, according to Caswell.

A "cutting feature" that separates one CBMS from another is the ability to link up with "offnet" services such as Telex and the U.S. Postal Service's Mailgram, he said. Forms creation is another state-of-the-art feature, Caswell added, explaining that it expedites message sending by prompting users through a menu-driven process.

Packages that offer both these capabilities include GTE Telenet Communications Group's Telemail, BBN Information Management's Infomail and Dialcom's Intercomm, he claimed.

Any Ascii terminal can send and receive CBMS traffic, usually at a speed of 1,200 bit/sec, according to Caswell. Some IBM 3270-compatible terminals also have the ability, but at higher speeds to 2,400 bit/sec, he said.

Based on 'Risk Assessment'

The decision to go with a CBMS package is based on "risk assessment." "You can't cost-justify electronic mail in hard dollars any more than you can the telephone," the firm's president said. Like the telephone, a CBMS saves time (up to an hour a day) and adds new capabilities. He also said electronic mail enhances group planning by allowing users to send a message to multiple users simultaneously.

The way to minimize risks is by starting with a pilot project that utilizes a public service, according to Caswell. Project members should form a "community of interest," meaning they should be people who normally communicate with each other at work. Caswell warned against lumping several top managers together in the pilot project.

The only money that will be lost if the project fails is whatever was invested in terminals — an amount he said was comparable to 2% of the average executive's salary. Conversely, gains up to 10% of that same salary may be gained with a successfull CBMS implementation, according to Caswell.

SAVE TIME & MONEY ON DATAPOINT PRINTING

D&O Leasing's Datapoint Compatible Dataproducts B-1000 can save you time and money. It saves time with its 1000 LPM, 64 character printing mode. As for money, where else can you get a fully Datapoint compatible, quietized (60 DBA) printer, with cabinet for as low as $10,524.00 in quantity?

The modified Dataproducts B-1000 also features: clear printing for originals and five duplicates, 132 columns, 96 characters in stored print modes, patented frictionless hammer, complete built-in diagnostics and truly rugged construction. Of course, national service is available — in over 150 locations.

D&O Leasing specializes in printers compatible with Datapoint systems. We've been supplying Datapoint users for seven years — we can provide the printer for your Datapoint system, almost always at a lower price.

23361 Peralta Drive, Laguna Hills, California 92653
714/581-0333/2222 • 800/854-6024

D&O LEASING, INC.
Low-cost printers for Datapoint systems

Structured Systems Unveils OA-Oriented Products

OAKLAND — Structured Systems Group has unveiled several office automation oriented software products.

The vendor calls the Word Right word processing system for CP/M microcomputers the first to use simple English-like commands. It allows users to learn and operate the system without having to memorize unfamiliar "dot" or initial commands.

Word Right costs $500.

The Magic Worksheet is an electronic spreadsheet for CP/M computers. It features menus of system functions and commands and prompts the user for specific information or commands.

Magic Worksheet costs $250.

The vendor's accounting packages run on Hewlett-Packard Co.'s HP 125 and IBM's Displaywriter. Applications include accounts payable, order entry, inventory and payroll. Prices for the packages run between $250 and $350.

The Sales Rep package is a user-interactive program that automatically defines the needs of prospective customers while explaining the features and benefits of the vendor's accounting packages.

Sales Rep costs $500, the vendor said from 5204 Claremont, Oakland, Calif. 94618.

Xerox Copiers Yield Profits

(Continued from Page 103)

groups represent the largest part of office expenses. In order to capture the groups, it introduced the Star professional workstation and 820 personal computer in 1981.

The report argues that the success of Xerox' OA strategy hinges on how well the company takes advantage of the time lead the baseband technology-based Ethernet enjoys over the broadband Wangnet from Wang Laboratories, Inc. and other expected systems from IBM and AT&T.

"Ethernet is far from being the ultimate networking scheme," the report declares. "If Xerox is not able to convince a significant number of the Fortune 1000 to commit to Ethernet in the next year, the system stands to be eclipsed."

The report goes on to predict that in the "intermediate term" Xerox will introduce an executive workstation priced between Star and the 820. Beyond that, it will use its copier sales force to sell complete office systems to major accounts and increase the scope of Xerox Computer Services, particularly in the area of software development.

The stakes are high for Xerox. In a grim warning, NBI states: "The demon that drives management on is the prospect that failures could make Xerox the buggy-whip maker of this half of the 20th century."

The 210-page "Xerox: A Strategic Analysis" costs $575 from Northern Business Information, Inc. at 66 W. Broadway, New York, N.Y. 10007.

DELTAK and CW Communications can help you make an intelligent decision about Business Personal Computers

Conference Journal

Computerweek

During COMPUTERWEEK, a national conference presented by the publishers of *Computerworld, Computer Business News* and *Infoworld*, DELTAK videotaped a broad range of sessions by industry experts sharing their insights into business personal computing. These sessions are now available as a Conference Journal, ***Personal Computing: A Business Perspective,*** exclusively from DELTAK, the world's leading producer of video-based DP and management training programs.

Who is buying personal computers? How will they affect your business? What benefits can you expect, and what problems? Who are the vendors? What should you look for in a modern micro? What about programming languages, networking, shared data bases? How is IBM's entry into the market affecting prices and competition?

The Answers to These and Other Questions... are provided by the people who are right in the middle of the micro revolution — Trip Hawkins, Apple Computer; Harold Kinne, Halkin Computer Corp.; Dan Bricklin, codeveloper of Visicalc; Jim Finke, Commodore International, Ltd. — and many others.

Six Video Sessions... *Personal Computing: A Business Perspective* includes six 20-30 minute color video sessions, each focusing on a specific issue surrounding personal computers in business:

Thinking Small for Big Business

The Purchase Decision

Finding a Vendor

Sales Trends and IBM

New Languages... and Networking

A Look Toward the Future

To Order... one or more video sessions from ***Personal Computing: A Business Perspective,*** call DELTAK Order-Entry at 312/920-0700. Stay on top of the hottest trend in computing since the chip. Order the Conference Journal today.

DELTAK

1220 Kensington Road
Oak Brook, IL 60521
312/920-0700

In Canada Contact:
Deltak
6845 Rexwood Road
Unit 8
Mississauga, Ontario
L4V 1S5
416/678-9222

All U.S. Sales/Use Tax Rates on magnetic tape...

SALESTAX®

Vertex Systems Inc.
900 Old Eagle School Rd., Wayne, PA 19087
215-687-9050

SLASH MVS COSTS

MICS, the MVS Integrated Control System, slashes costs for: • *Processing of Performance Data* • *Staff Development and Support* • *Report Generation* **. . . and provides the ability to respond to previously "unanswered" information requests.**

MICS is used daily in over 175 data centers for:
• *Crises Reporting* • *Performance Management* • *Capacity Planning* • *Management Reporting* • *Accounting* • *Special Studies*

MICS is truly a state-of-the-art advancement for data center management. But don't take our word for it, listen to what our users, the people in the trenches, are saying:

"We use MICS for computer measurement, capacity planning, and user support, and it provides at least a 4:1 productivity improvement in programming time. The reasons: the data is there in a form ready for immediate access and reporting, and the data comes from a single source."

—Operations Analyst

"MIS managers who previously used 'best guess' techniques are now using MICS data to project quarterly resource utilization.
"MICS enhances capability to do things we previously did not have the knowledge, time, personnel, or system resources to do."

—Performance Analyst

"MICS is a fantastic time saver! We wrote a program for MICS for optimizing service units coefficients based on a 35-step approach recommended in a performance bulletin. The program runs interactively in 2 minutes elapsed time; without MICS it would have taken 3 hours."

—Staff Specialist

"Reporting and extracting data from MICS is easy, and the documentation fantastic. Whereas it once took three to four days to produce some reports, with MICS it now takes about 10 minutes."

—Senior Systems Analyst

"MICS is our prime software package. If we didn't do anything else outside of reorganizing people's attitudes, time and workloads, we'd have it just for communication purposes between management and technical people. Often requests for information are answered within minutes."

—Manager, Technical Services

"Our users are amazed at the quick, reliable, and accurate information MICS gives; questions can now be answered in as little as a half hour. When our users are asked where they would be without MICS, they quickly answer, 'We'd be out of business relative to computer services.'"

—Systems Programmer

If you want to learn how to slash your MVS costs and respond to "unanswered" information requests, please send for information on MICS.

MORINO ASSOCIATES, INC.
8133 Leesburg Pike
Suite 602
Vienna, Virginia 22180
U.S.A.
Tel: (703) 734-9494

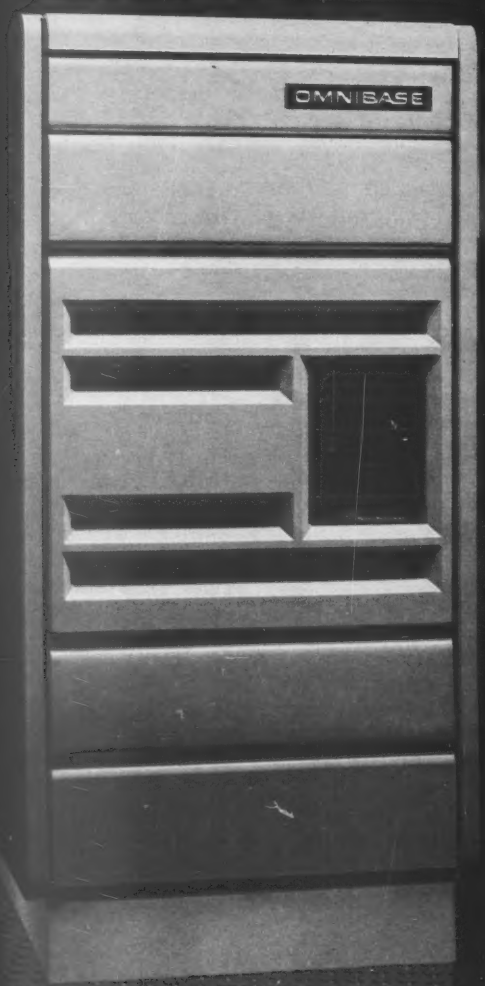
MORINO ASSOCIATES (UK) Ltd.
118 Victoria Street
St. Albans
Hertfordshire
England AL1 3TG
Tel: St. Albans (0727)37464

Ask about the new installation accounting and system reliability components!

ANNOUNCING OMNIBASE:
THE VAX HIGH-PERFORMANCE DATABASE SOLUTION.

The high-performance VAX VMS user-friendly relational database management system is here! OMNIBASE from Signal Technology Inc. OMNIBASE has an easy-to-use interactive query language along with embedded query capability for your VAX-FORTRAN and VAX-COBOL programs, plus interfacing to VAX DCL and FMS. Incorporating a back-end relational database machine, OMNIBASE is the end-user VAX/VMS high-performance database management system for the '80's, available now for evaluation on our nationally available VAX time-sharing facility. For performance analysis notes and other information, please write or call Signal Technology, Inc., 5951 Encina Road, Goleta, CA 93117, (805) 683-3771. Outside California, call toll-free (800) 235-5787.

Signal Technology, Inc.



COMPUTER INDUSTRY

Magnuson Looks To Settle Debts

By Marcia Blumenthal
CW Staff

SAN JOSE, Calif. — Magnuson Computer Systems, Inc. will probably determine this week to what extent it will be able settle the $6.5 million in current indebtedness to its trade creditors.

On June 2, the company held a meeting with its creditors to hash out the final agreements for payment of accounts owed these vendors. Some 35 suppliers turned out for the meeting, according to Robert Stephens, a Magnuson vice-president.

If the firm had to pay the total $6.5 million outstanding to creditors, it could not stay afloat, Stephens said.

However, the firm's principle lender, the Bank of America, has a secured position on all the firm's assets. Therefore, trade creditors, who do not hold a secured position, would be unable to collect any payment if

(Continued on Page 116)

Canadian, U.S. Firms Join Venture To Form International DP Coalition

By Jake Kirchner
CW Washington Bureau

QUEBEC CITY — Representatives of Canadian and American computer firms met here recently with their counterparts from a dozen Western nations to begin forging an international coalition of information industries.

Under the auspices of the Canadian Computer and Business Equipment Manufacturers Association and similar groups from around the world, the industry representatives sought a common ground on a number of issues of concern to producers of information products and services, including transborder data flow, international trade, telecommunications and standards.

The International Information Industry Conference attracted more than 200 representatives of industry, government and academia from Canada, the U.S., England, France, Italy, Switzerland, Germany, Sweden, Australia, New Zealand, Brazil and Japan, among others.

Opening the conference was Grant G. Murray, vice-president and general counsel of IBM Canada Ltd., who stated that "as a by-product of our success we, as members of the information processing industry, increasingly find ourselves trying to cope with concerns and issues which are not only inherently complex, but which also transcend national boundaries."

Noting "the increasing internationalization of our industry's environment," Grant explained that "some of us came to the conclusion that, although we were actively involved at the national level with such issues as privacy, telecommunica-

(Continued on Page 110)

Supplier, Two Execs Charged With Conspiracy in Theft

By Jeffry Beeler
CW West Coast Bureau

SAN JOSE, Calif. — A local electronics supplier and two of its principals have been charged with conspiracy and receipt of stolen property for allegedly contributing to the theft of $200,000 worth of minicomputer disk systems.

W/W Component Supply, Inc., its president, Brent Wright, and its treasurer, Timothy Wedlake, stand accused of buying more than 800 stolen Shugart Associates, Inc. disk units from two of Shugart's warehouse employees. Wright and Wedlake allegedly acquired the pilfered systems for a fraction of their retail price and then resold the goods at a discount to local distributors and end users alike, according to an area law enforcement official.

Each suspect now faces one count of conspiracy and multiple counts of receiving stolen

(Continued on Page 115)

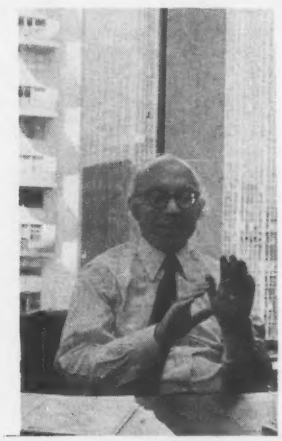


Photo by M. Blumenthal
Seymour Altucher

Consco Approaches 'Household' Tag

By Marcia Blumenthal
CW Staff

NEW YORK — Although Consco Enterprises, Inc. here has been around since the late '60s, the software firm isn't exactly a household name in the industry. But that situation may be changing now as the company picks up steam, moving into the accounting information arena.

Until now Consco has been known primarily for its Consolidation package, which has about 55 users, many among Fortune 500 companies.

Recently, however, it introduced a totally new version of its Accounting Information System (AIS), which goes beyond general ledger accounting systems now on the market, according to Seymour Altucher, the company's president.

Custom Beginnings

Like many of his counterparts in the packaged software market, Altucher started his firm designing custom software. He went about designing the company's first products "in a general way." At the time "we really didn't understand the implications of generality," he explained.

Altucher devised this general approach from lessons learned as a system software designer with Sperry Univac. However, he tired of system software, because "I had no concept of who the user was. I couldn't talk to anyone and after a while that got to me."

What Altucher means by generality is a relational data base management approach to general ledger systems — data base with a small "d," added Don Goodman, the company's vice-president. "It's Vsam files, but the ability to get to the data is not restricted by any assumed usage."

With AIS, users define the data environment and can pick out and relate data items located in disparate places within a set of data. "There is no limitation on how data can be select-

(Continued on Page 108)

A Way to Keep Computers on the Right Track

The Beall Channel Switch. Lets you switch critical on-line services to another CPU when failure occurs. Allows specific peripherals to serve more than one computer. Redrives all CPU signals to give you far more flexibility for physical placement of peripherals.

And Beall does all of this less expensively, more reliably and with less opportunity for operator confusion than anyone else.

We make five basic models to provide up to eight switchable interfaces each of which can be logically connected to as many as eight CPUs.

Want to track down more facts? They're in our new brochure. Write or call for it today.

John Beall & Company, Inc.
9103 Third Avenue • North Bergen, N.J. 07047 U.S.A. • 201 854-3562

Major Car Maker Opts for Flexibility Of General Ledger System as Standard Equipment

DETROIT — When Ford Motor Co. here decided to install a common general ledger system for its U.S. operation, it reviewed 75 such packages on the market.

Until now, the car maker has used a system built in-house, according to Ted Danielson, manager of the Finance and Staff Systems Department of Ford's finance staff.

Some 20 to 30 accountants and systems people served on the review committee, which made its decision on the package last December.

The committee narrowed to four the number of finalists, eventually selecting Consco Enterprises, Inc.'s Accounting Information System (AIS).

While Danielson declined to name all the other finalists, he did say Management Science America, Inc. was one of them.

Flexibility Impressive

While Consco was by no means a "shoo-in," Danielson reported the committee was impressed with the flexibility of the system.

There are more tailoring capabilities in AIS, Danielson reported, noting that the firm's account structure is "unusual." Moreover, it was designed for a large multinational company.

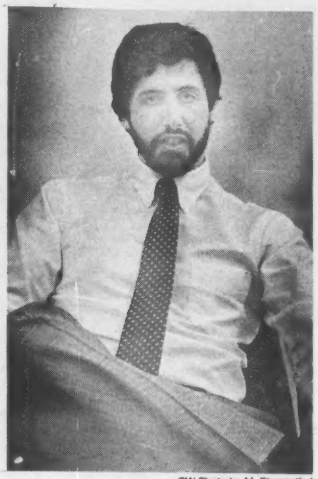
Consco was not totally unknown to Ford, however. Danielson said that the company had looked into acquiring Consco's Consolidation package in the past, but never followed up on the inquiry.

In making its final determination to go with AIS, Ford visited Eaton Corp., one of the users of AIS, noted Danielson.

The fact that Consco as yet has very few users for AIS made Ford very nervous, Danielson said, but Ford was impressed with the performance of the package.

The first implementation of the package, which is priced in the $200,000 range, will be in the corporate central accounting service and the body and assembly group in the Electrical and Electronics Division, according to Danielson.

Consco Shoots For 'Household'



CW Photo by M. Blumenthal

Don Goodman

(Continued from Page 107)

ed and combined in the system," he maintained. In addition, the system sports a report writer that allows multiple formats in the same report, he said.

Traditionally, users have been tuned to an account master approach to general ledger systems, but today there is a whole generation of users out there who know that system and see its limitations, Goodman stated.

An accounting and computer science major at Wharton, Goodman joined Consco in 1975.

While Goodman implied users weren't ready for Consco's approach, Altucher was candid, admitting that in the past the firm has also been "incredibly naive" about marketing.

But that naivete appears to be a thing of the past.

New Sales Punch

Consco is positioning AIS as the high-end system in the general ledger market. Altucher and Goodman still sell, and the firm is in the process of bringing on additional sales personnel.

However, Consco sees itself a "software supplier consultant" rather than a packaged vendor, Goodman said.

But the company has plenty of stiff competition from traditional general ledger vendors.

"When we give a marketing presentation, we study the customer's annual report; we call their accounting firm." Altucher said.

"We know what kinds of things they are look for and the problems of the customer's industry," Altucher continued.

A typical installation takes 30 to 40 days of training. Consco just hired additional support personnel and moved that operation to Edison, N.J.

Recently, the company held its first users group meeting and has established a support agreement for its users.

The company is operating at the $2-million revenue level today, and Altucher expects to at least double that figure next year.

The firm expects to add 15 to 20 new installations this year and is shooting for 40 next year.

MCAUTO ENTRY

COMPUTER SERVICES NEWS

New–a computer system that designs computer systems!

Build and maintain structured diagrams with push-button speed.

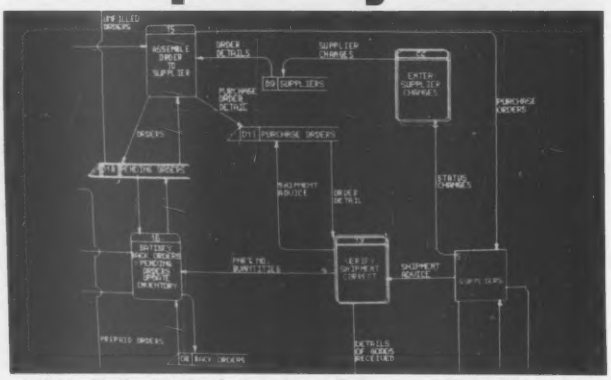
If your work is structured systems design and analysis, you're probably using some kind of hand graphic technique. And what you've found is that the work is tedious, time-consuming and prone to error.

Now there's a better way: STRADIS/DRAW from MCAUTO, the only system of its kind commercially available.

Designs in minutes instead of hours.

STRADIS/DRAW is an automated graphic system with which you interactively create and update two-dimensional structured diagrams. It does away with the need for manually drafting and re-drafting graphics and up-dating documentation. It eliminates the need to proofread diagrams, and avoids the potential for error in going from one diagram to the next. You get total capability to produce even the very largest data flow diagrams found in system planning.

All the graphic symbols you need to construct data flow diagrams are within the STRADIS/DRAW system. Just call up the symbol with the touch of a terminal button and move it to the desired spot on the display screen. Create your system structure chart the same way. All the symbols you need to set up and describe modules, interfaces and control hierarchy are at your fingertips.



The system's free-form diagram function gives you an easy way to draw any charts or diagrams you need for data processing documentation. Or use it to draw flowcharts, screen layouts, report layouts, graphs—all of which can be maintained in the system for quick reference and easy updating.

Fast to learn, easy to use.

STRADIS/DRAW system functions are presented in a logical design sequence. The system prompts you step by step with menus written in ordinary English. The color display terminal is built to "zoom" and "pan" for easy diagram viewing. And you can get hardcopy reproduction of any terminal visual in seconds.

For more information about STRADIS/DRAW and how it can give you better designs, faster, and at a lower cost, call MCAUTO at (314) 232-5715. Or mail the coupon.

W. R. Vickroy, MCAUTO, Dept. KAJ-500
Box 516, St. Louis, MO 62166

☐ Please send me information on MCAUTO STRADIS/DRAW

☐ Have your representative phone me for an appointment.

Name

Title

Company Name

Address

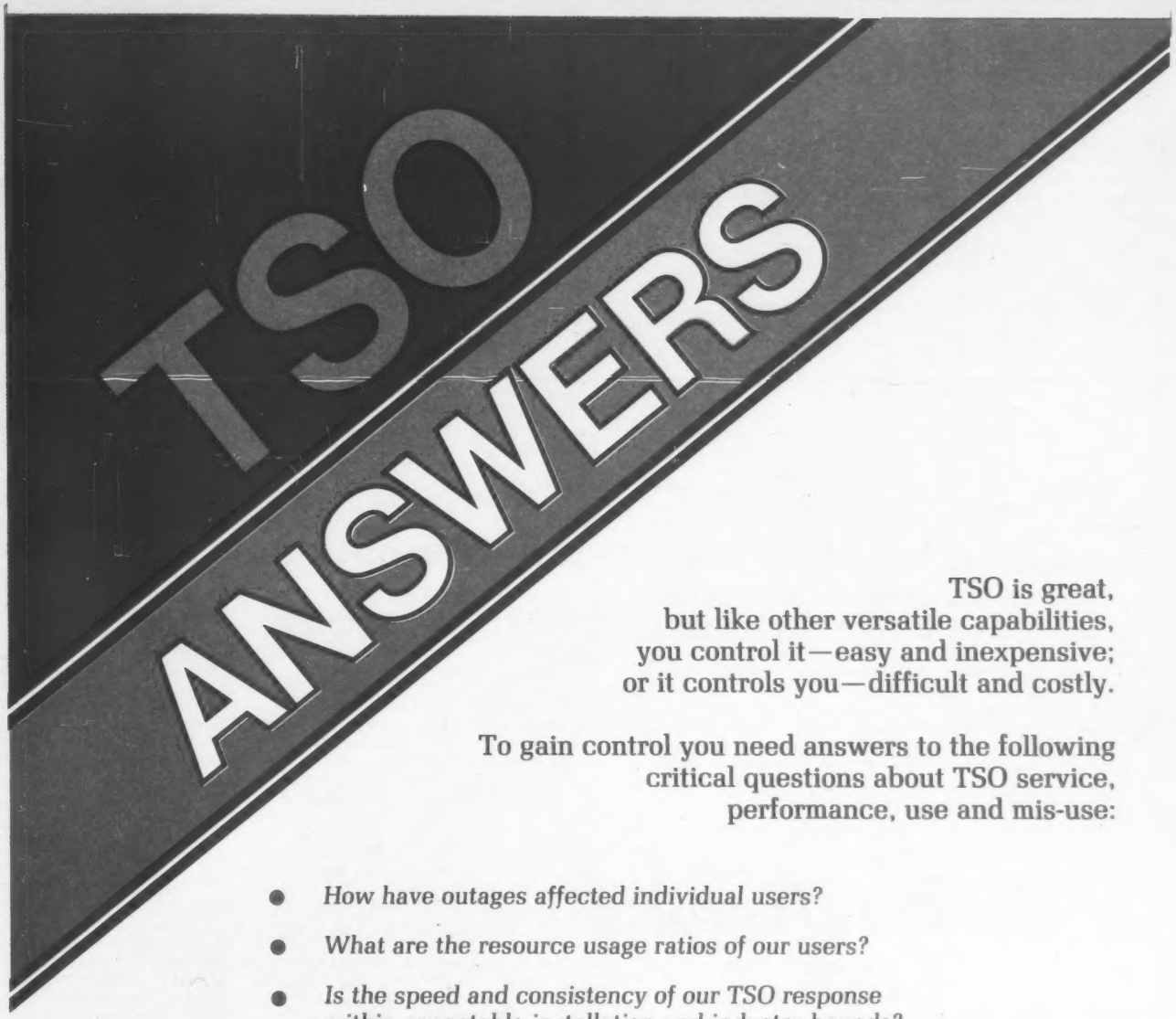
City

State Zip

Phone

MCAUTO
MCDONNELL DOUGLAS
Setting the standard in computer services

MCAUTO and ENTRY are registered trademarks of the McDonnell Douglas Corporation



TSO is great,
but like other versatile capabilities,
you control it—easy and inexpensive;
or it controls you—difficult and costly.

To gain control you need answers to the following
critical questions about TSO service,
performance, use and mis-use:

- *How have outages affected individual users?*
- *What are the resource usage ratios of our users?*
- *Is the speed and consistency of our TSO response within acceptable installation and industry bounds?*
- *Who are the users of specific libraries, programs and commands?*
- *What is the usage-intensity of users, departments, projects?*
- *What are the service and resource consumption statistics for all of the departments and/or projects running TSO?*

If you want to control TSO, the TSO/MON program product, TSO Performance Statistics, and our TSO Management articles will assist you in finding the answers. They have for over 450 installations worldwide; write, or call for information.

MORINO ASSOCIATES, INC.
8133 Leesburg Pike
Suite 602
Vienna, Virginia 22180
U.S.A.
(703) 734-9494

MORINO ASSOCIATES (UK) Ltd.
118 Victoria Street
St. Albans
Hertfordshire
England AL1 3TG
727-37464

Information Firms Told to Educate Governments

By Jake Kirchner
CW Washington Bureau

QUEBEC CITY — A former high-level official of the U.S. State Department last week chided the information companies of the world for not better educating their governments to the importance of their products and services and to the need to support domestic high-technology industries.

Addressing a session on informatics at a recent international information industry conference here, Matthew Nimetz, until recently undersecretary of state for security assistance, science and technology, said "the education of our political leaders about the dimensions and development of our information-based societies is the paramount challenge facing us."

Saying governments "will play a major role in shaping the development of informatics," Nimetz, now a New York attorney, stated "as a former govenment official I can attest to our lack of information and the inadequacy of our governmental structures and the sporadic and unstructured nature of consultations between the government and the private sector."

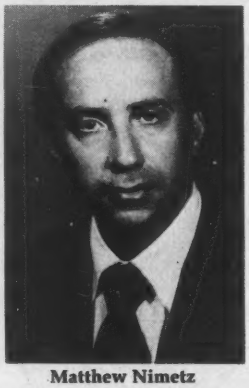
As in many international discussions of informatics, the recent session focused particularly on transborder data flow. Control Data Corp. President Robert M. Price argued that "when stripped of the euphemistic titles, such as 'transborder data flow' or 'informatics,' what we're talking about . . . boils down to protectionism."

Price's comment that much national privacy legislation is only a cloak for "economic nationalism" was immediately countered by Carlos Guiliano, of the Intergovernmental Bureau for Informatics, a Third World organization, who decried what he called "unguarded talk about the threats to the unencumbered flow of information."

Unguarded Talk

Later, Carlos Guiliano of the Intergovernmental Bureau for Informatics, decried what he called "unguarded talk about the threats to the unencumbered flow of information."

Guiliano said, this kind of talk "has left the impression that the world is gathering into bastions of opposition to the concept of information interchange . . . We do not find any basis in fact for such allegations."



Matthew Nimetz

But, he continued, "we do see a danger that unless careful thought is given to systematic policy development among nations, the situation could evolve into a world composed of information-rich and information-poor nations rather than a global sharing of universal knowledge."

"Some of the ignorance in the government sector is quite understandable," Nimetz said.

"We tend to learn about industries that are in trouble" and "this industry has never had to come to the government for help," Nimetz attested.

Whatever the cause of this ignorance, most government officials "are very superficially informed" about high technology.

U.S., Canada Attend International Coalition

(Continued from Page 107)

tions and ergonomics, we weren't terribly confident that we fully understood their international implications."

The gathering here was also the result of a growing industry awareness that internationally the issues of concern to information companies increasingly are being influenced and resolved by political organizations, both national and international, which only rarely represent the interests of the corporations and organizations that provide the products and services of the information revolution.

As the preliminary development of an international federation of information industry associations, the groups worked to identify issues of common interest, which the associations hope can be addressed by the participants over the next year and eventually lead to development of a united industry front.

In the future, it was suggested, such an international coalition could bolster industry representation before national governments and international organizations. The need for enhanced communications and cooperation among the world's industry representatives was also cited as a motivation.

While pushing for increased international representation of their concerns, needs and goals, the companies gathering here also displayed considerable interest in meeting what they termed their responsibilities to their customers around the world. In that vein, there was an extended dialogue between the participants and Carlos Guiliano, a representative of the Rome-based Intergovernmental Bureau for Informatics, which assists developing nations in their nascent efforts to assimilate and manage advanced information technologies.

Addressing the conference Tuesday, Quebec Prime Minister Rene Levesque told his audience that "you, the leaders of that veritable [information] revolution . . . have a responsibility that is unprecedented in all history.

Venture/Equity Capital

$500,000 TO $10,000,000 FOR:

High Technology · Growth Capital
Leveraged Buyouts · Medical Products
Manufacturing · Communications
Start-Ups · Bridge Financing
Software · Energy

If you have a comprehensive business plan, call 312/828-8021, or write: John L. Hines, William Putze, Paul R. Wood, Ronald C. Baldwin, Seth L. Pierrepont, Judith A. Bultman, Robert P. Cummins or John F. Tomlin.

CONTINENTAL ILLINOIS VENTURE CORPORATION
CONTINENTAL ILLINOIS EQUITY CORPORATION
231 South La Salle Street, Chicago, Illinois 60693

LEARN CICS THIS SUMMER

COURSE	JUNE	JULY	AUGUST
APPLICATION DESIGN	NYC 6/1-4	NYC 7/26-30	–
COMMAND LEVEL PROGRAMMING	NYC 6/14-18	NYC 7/12-16 CHI 7/19-23	NYC 8/9-13
COMMAND LEVEL INTENSIVE (2 wknds)	NYC 6/19-20 & 26-27	CHI 7/17-18 & 24-25	NYC 8/7-8 & 14-15
MACRO LEVEL PROGRAMMING	NYC 6/21-25	–	–
INTERNAL ARCHITECTURE	NYC 6/28-7/2	NYC 7/26-30	–

Not all CICS courses are alike. Only SysEd prepares reference manuals full of real life sample programs and case studies—the kind you'll need and use long after you've taken the course. Only SysEd has fully-equipped Computer Labs where you'll spend hours in workshop sessions actually programming CICS on our 4341 computer using 3270's dedicated to the class. Classes are held in New York City and Chicago. So get smart this summer, call David Shapiro (212) 889-3386.

SYS-ED
ONE PARK AVENUE, NEW YORK, NY 10016 • (212) 889-3386
A Division of INTEGRATED COMPUTER SOFTWARE, INC.

PERFORMANCE

We can help.

One key to being a superior performer is anticipating your next move, looking forward, while at the same time putting your full effort into the present.

To keep you and your computer system competitive, Storage Technology Corporation is investing heavily in new technology designed for performance.

This investment is already paying you dividends in the form of intelligent peripherals that migrate functions out of your computer.

Consider, for example, the 4305 Solid State Disk, a dedicated paging system that can improve page response as much as 500%. Or the Impact 3000, a quality band printer that's up to 50% faster than its competitor. Or consider the 8360, a fixed-media disk that's available now to cut I/O response as much as 45%.

The recently introduced "Sybercache" intelligent disk controller anticipates CPU requirements, fetches needed information, and is prepared to supply data as it is requested.

Designing intelligence and reliability into subsystems explains why Storage Technology has been able to double large system I/O performance over the last few years. Our newest products offer you even greater cost performance improvements.

To find out how your computer system can benefit from Storage Technology performance, contact your local marketing representative today. Or write: Storage Technology Corporation, 2270 South 88th Street, Louisville, CO 80027. Phone: (303) 673-4063.

STC

Storage Technology Corporation

U.S. Slant on High-Tech Trade Seen Gaining

By Jake Kirchner
CW Washington Bureau

QUEBEC CITY — The U.S. push to include high-technology and services industries issues in existing international trade agreement mechanisms is gaining acceptance around the world, a high-ranking official of the General Agreement on Tariffs and Trades (Gatt) secretariat said recently.

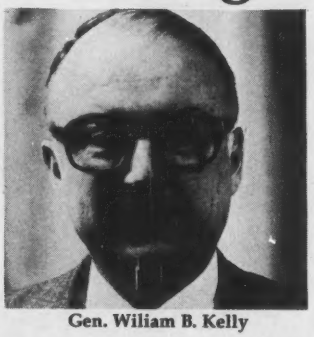
Deputy Gatt Director Gen. William B. Kelly said during the recent International Information Industry Conference here that most industrialized nations now accept, although in some cases reluctantly, U.S arguments that high-technology trade issues are sufficiently important and complex that they should be subject to Gatt study.

Over the last 35 years a series of multilateral trade negotiations by Gatt members have produced the basis for most trade agreements between the Western industrialized nations. Now, the U.S. contends the Gatt accords must be modernized to cover the increasingly sizable amount of trade conducted by high-technology and services industries, such as telecommunications and data processing.

U.S. Work Program

At a high-level ministerial Gatt meeting to be held in Geneva in November, the U.S. will propose what Deputy U.S. Trade Representative Michael B. Smith described here as "a work program to examine the existence of barriers and distortions to high-technology trade and to recommend measures by which Gatt might improve the environment for trade in high-technology goods and services."

Michael B. Smith



Gen. Wiliam B. Kelly

Smith noted that because of the importance of these industries and the poor worldwide economic climate, many countries are tempted to intervene on behalf of their high-technology sectors. The U.S. is no exception; there are numerous bills pending in Congress that would restrict foreign access to U.S. markets unless American firms are free to compete abroad.

While the U.S. is conducting bilateral negotiations with a number of countries, including Japan and Canada, for moderation of what American companies see as unfair trade barriers in high-technology sectors, the Reagan administration believes long-term solutions to these problems must come through some organized mechanism to resolve growing trade disputes in high technology.

Defuse Domestic Urges

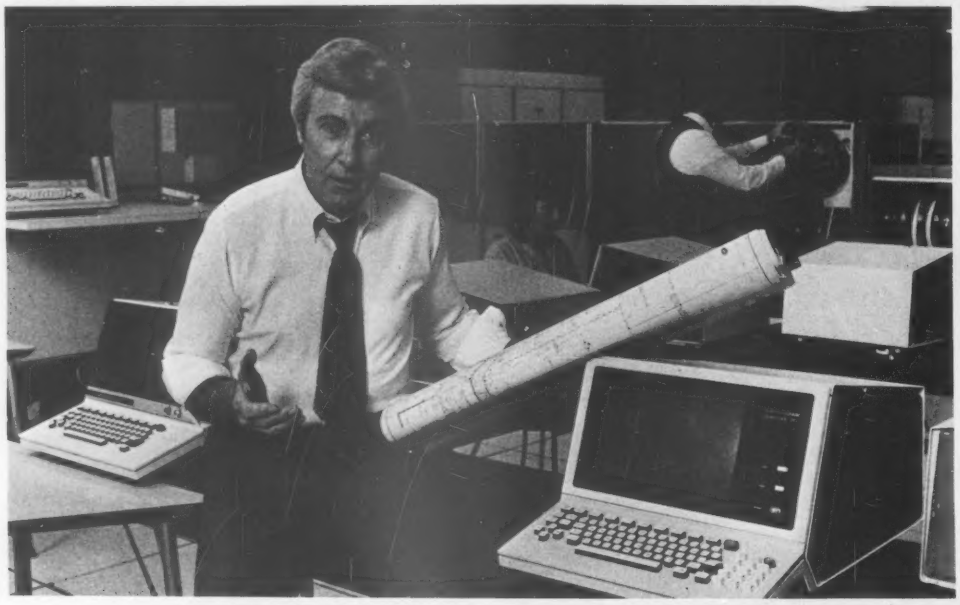
The White House also sees the Gatt work program as a way to defuse domestic urges to pass trade reciprocity legislation. With a few exceptions, the U.S. high-technology information industries support the administration's efforts to try to resolve these issues within the Gatt framework.

But according to Kelly, "in the high-technology area, frankly, the United States ... does not have the support of the other [Gatt] parties." The problem the U.S. faces in bringing these issues before Gatt, he told the conference, is that "the U.S. has been very unclear about its objectives."

Also, he said, the view from the Geneva-based Gatt organization is that "we're at a very early stage" in the willingness and ability of the world's trade negotiators to tackle problems "not only in the high-technology area, but in the services area and the investment area."

In comments made following his address, however, Kelly said he detects a growing international acceptance of the U.S. arguments on these issues. Trade negotiators do not know a lot about these issues and often feel Gatt resources would be better allocated to addressing existing and equally pressing problems in trade that are already covered by Gatt accords, he said.

But, he continued, the U.S. has considerable influence in Gatt and has been vigorously pushing its work program plan. He said he could not predict what the Gatt ministers would decide on this issue in November.



"OUR C & D COMPUTER BACK-UP POWER SYSTEM SAVED US FROM SEEING RED WHEN THE LIGHTS WENT OUT."

A break or other variance in AC voltage lasting just one nanosecond can destroy the accuracy of computer programs in progress. A few seconds longer and memory banks, storing data worth tens of thousands of dollars, could be wiped clean. Outages may even cause expensive hardware damage. Now, with a UPS (Uninterruptible Power Source) using C & D batteries, you can provide the on-line power necessary to save valuable computer data and equipment during a momentary surge or blackout.

Because when the lights go out, reliable battery power from a UPS may be all that stands between a profitable computer installation and financial disaster. Specify dependable C & D batteries and you'll discover the reasons why so many Fortune 500 companies have made C & D North America's leading supplier of industrial batteries...

Reliable, On-line Power—C & D cells provide 20 years or more of dependable on-line power.

Compact Systems—C & D's exclusive 4LCW battery requires 40% less space than other systems.

Longer Water Intervals—C & D batteries operate with watering intervals of up to 2 years.

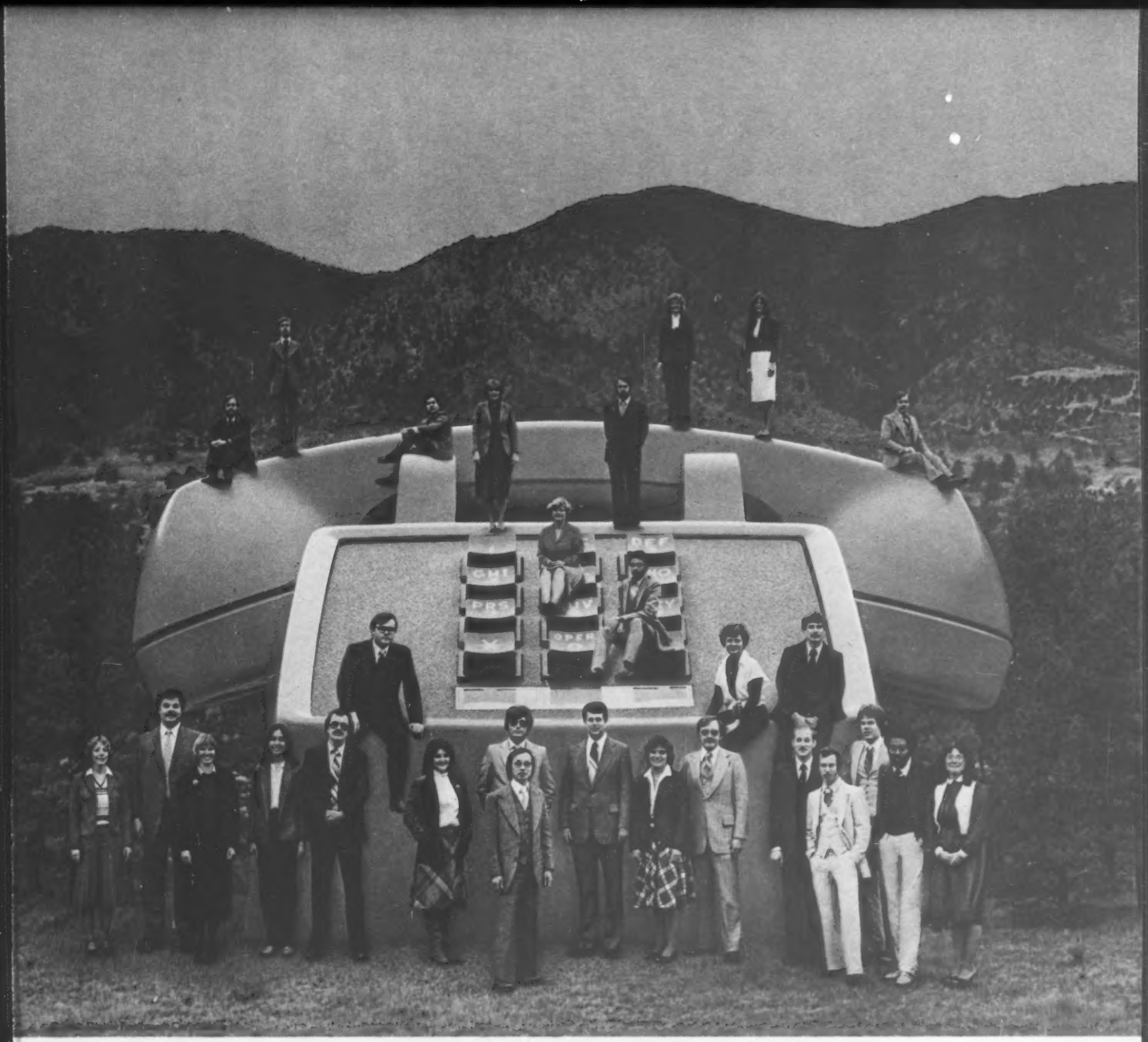
Superior Electrical Conductivity—C & D's unique copper post inserts improve connection integrity and high discharge rate performance.

Expert Installation and Maintenance—75 offices nationwide put specially trained service personnel as close as your telephone.

For more information on UPS batteries from C & D, or any other industrial battery need, check the Yellow Pages for the C & D office nearest you.

C&D Batteries
An ALLIED Company

3043 Walton Road, Plymouth Meeting, PA 19462
LEADER IN BATTERY ENERGY SYSTEMS



Digital's software support teams. They're good. They're fast. And they're right by the phone.

Every call handled by a specialist. Every specialist backed by a team.

When you have a software question, time is of the essence. Your business could depend on a fast answer.

That's the reason behind Digital's Telephone Support Centers in North America, Europe, Japan, and Australia.

If you subscribe to this service, you can call the center if you have a question. As soon as we take your call, we'll retrieve your customer file electronically from our data base and put you in touch with a software specialist, who will be backed by a team of experts in your particular Digital operating system.

Often, this specialist can handle your problem right away. If not, other members of the team will be consulted automatically.

From then on, the team is responsible for getting that problem resolved. And they'll stay on it until they do.

It's all part of Digital's commitment to provide you with the most advanced, most responsive, and most comprehensive software support anywhere.

For more information about Software Product Services, contact your local Digital office.

digital

We change the way the world thinks.

AVOID FUTURE SHOCK

WITH THE NEW, EASY-TO-USE FORECASTING SYSTEM FROM SOFTWARE INTERNATIONAL.

Things happen so fast today it's hard to know what to do next. Future shock hits when the wrong decision catches up with you.

Until now, forecasting systems have been so difficult to use, many managers were forced to wait and see what happens! But now they have a system that is incredibly easy to use. They will wonder how they were ever able to manage without it.

For forecasting applications, this is THE SOFTWARE: the most complete package of features *plus* the best training, documentation and support in the industry. This system enables users to ask "what if" questions and generate comprehensive reports on the outcome — in minutes. Because the system is powerful enough to handle the complex forecasting needs of multiple users simultaneously, demands on the DP department are dramatically reduced.

Now available in IBM and IBM plug-compatible OS and DOS versions, this is the latest innovation from Software International. A subsidiary of General Electric Information Services Company, we are part of a world-wide family of more than 5,000 computer professionals putting information to work for the future of business.

Here's a quick glimpse at just a few of the system's many capabilities: clear financial projections; flexible budgeting; accurate cost analysis. Risk analysis, probability distributions and statistical analysis make sense of the most complex business environment and the numbers that relate to it. User security control facilitates protection of information.

Call or write today for your FREE 20-page, full-color brochure on the new Forecasting, Modeling & Reporting System. And make future shock a thing of the past.

FOR BUSINESS SOLUTIONS: THE SOFTWARE

SOFTWARE INTERNATIONAL®

Elm Square, Andover, MA 01810 (617) 475-3940

GENERAL ELECTRIC

Atlanta (404) 955-3705 Boston (617) 720-8982 Chicago (312) 298-3500 Columbus, OH (614) 773-2167 Dallas (214) 960-0220 Denver (303) 698-8591 Houston (713) 444-3348
Los Angeles (213) 573-0402 New York (914) 253-8050 San Jose (408) 292-9700 Wilmington, DL (302) 478-0960 Montreal (514) 935-5728 Toronto (416) 924-1481 Vancouver (604) 669-8122

Australia, Brazil, Colombia, France, Guam, Hong Kong, Israel, Italy, Malaysia, Mexico, Netherlands, Norway, Saudi Arabia, Singapore, South Africa, Sweden, United Kingdom

Silicon Firms Indicted

(Continued from Page 107)

property. Similar charges have also been filed against W/W.

The case reportedly marks the first time in Silicon Valley, Calif.'s, long history of high-technology theft that indictments have been sought against an entire corporation. In the past, the only defendants ever prosecuted for dealing in the area's electronics black market were the individual thieves themselves, according to Santa Clara County Deputy District Attorney Douglas Southard.

The thieves' corporations were left alone, even though many of the organizations were clearly "fronts" for their owners' lucrative fencing activities, Southard said.

Main Aim

The main aim behind the area's recent changes in prosecution tactics is to deter future high-technology thefts by encouraging otherwise negligent shareholders to monitor their companies' activities closely. For Southard, the emphasis on corporate shareholders is critical.

"I sometimes get the impression that shareholders or people in similar positions don't particularly care whether their companies are managed ethically as long as the organizations make a buck," he said. "But we feel that if a company is engaged in black marketeering, its shareholders bear at least some of the moral responsibility, even if they never become personally involved in the crime."

In keeping with Southard's sentiments, law enforcement officials here have recently taken steps to stiffen the penalties for corporate shareholders whose companies are found guilty of stealing another firm's products.

If convicted of all 15 criminal counts now facing it, W/W would find itself legally liable for up to $75,000 in fines, all of which would have to be paid directly from the shareholders' pockets.

Successful prosecution might also leave the company wide open to a civil suit, which in turn could force W/W to pay its alleged victim, Shugart, nearly $700,000 in damages and related expenses, Southard said. Under California law, thieves can be sued by their victims for three times the total amount of all theft-related damages, court costs and attorneys fees.

The double whammy of stiff civil and criminal penalties could put a serious dent in a convicted black marketeer's pocketbook and therefore will probably "serve as an effective deterrent to future high-technology theft operations," Southard said.

Southard's observations came hard on the heels of a recent Silicon Valley disclosure that W/W and its two key executives had been charged with buying 803 Shugart SA 400- and 800-series disk systems for a total of about $37,000. The stolen goods were allegedly furnished to the W/W officials last November and December by Shugart warehousemen Randy Casanave and Bert Mora, both of whom have already been convicted of the thefts.

Intel's IAPX 186 Integrates 16-Bit CPU

SANTA CLARA, Calif. — Intel Corp. last week announced its IAPX 186, a chip that integrates a 16-bit CPU and all other functions commonly found in a single-board CPU subsystem.

The new chip is expected to overlap about 40% of the current market for 8-bit devices, and by 1986 the 16-bit market will probably double, according to Bob Patterson, Intel's product marketing manager for microprocessor products.

The new chip is a follow-on to the company's IAPX 286, introduced last February.

Called the 80186, the device will eventually replace Intel's widely used 8086, he said. However, processors built with the new chip will be software compatible with all existing 8086 and 8088 software.

Integrates Enhanced 8086

The 80186 integrates an enhanced 8086, plus 15 to 20 support chips on one device. The chip will primarily be used to build systems for cost-sensitive applications such as personal computers and intelligent terminals, the firm said.

The IAPX 286, on the other hand, is used in systems that support multiple user and/or multiple tasks.

The announced price of the 80186 is $30 in quantities of 10,000 devices. With two address latches the chip is priced at $36 in the same quantities, compared with the current price of $74 for the 8086, Intel said.

The increased performance and reduced cost for 16-bit chips will eventually impact the market for 8-bit devices, Patterson said.

Microprocessors currently in production using 8-bit chips will continue using those devices, but new systems going into production will opt for 16-bit technology, Patterson claimed. Intel is located at 3065 Bowers Ave., Santa Clara, Calif. 95051.

"The proliferation of financial planning languages will create chaos throughout corporate management ranks. In the future, we will see one standard modeling language that extends from the personal desk-top computer to the central corporate information center."

G. R. Wagner, Ph.D.
Chief Executive Officer
Execucom Systems Corporation

Execucom is not in the business of catching up or staying put.

Nor are most of the executive-managers that we know. That's precisely why our leading-edge technology has provided IFPS®, the Interactive Financial Planning System. Financial planning becomes easier. More alternatives can be considered. Assumptions are more clearly understood and decisions are based on better information.

IFPS is now in its eighth enhancement and will continue to improve as it makes your people more productive and your company a better place to work.

Execucom will also continue to meet the challenges of the future as we develop the tools that will bring order to the chaos.

If you'd like more information, call toll free 1-800-531-5038, in Texas call 512-346-4980 or send the coupon to: Execucom, P.O. Box 9758, Dept. CW7-I, Austin, TX 78766-9758.

I'd like to know more about the leader in Executive Mind Support. Please send more information about IFPS and related products.

Name

Title

Company

Address

City

State Zip

Telephone

EXECUCOM

Supporting the mind with knowledge through technology.

Supershorts

Prime Computer, Inc. and EMC Corp. have reached an out-of-court settlement of Prime's suit against EMC.

Because of the confidential nature of the information involved, the terms of the settlement were not released and the firms will make no further public comment on the matter.

— — —

Amperif Corp. has formed a research and development partnership, Amperif Research Partnership — 1981, with TC Enterprises, Ltd. of Oklahoma, to develop two versions of a cache disk memory system for the IBM market.

The partnership has secured $1.75 million in funding through Stifel, Nicolaus, & Co., Inc. based in St. Louis, Mo.

— — —

SLI Industries, a manufacturer of 8-in. Winchester disk drives, has changed its name to Megavault and has relocated to 6431 Independence Ave., Woodland Hills, Calif. 91367.

— — —

Lear Siegler, Inc.'s Avitron International Division is setting up distributors and negotiating manufacturers' licensing agreements in Brazil, Argentina, Chile, Ecuador, Venezuela, Colombia, Panama, Uruguay and Peru as part of an expansion of Lear Siegler's Data Products Division into the South American market.

— — —

State Street Bank and Trust Co. of Boston and NCR Corp. have formed an electronic payment network that will reportedly link New England area financial institutions and retailers into the region's first comprehensive electronic funds transfer system.

State Street has ordered 250 automated teller machines (ATM) and computer-based software and services from NCR, valued at $10 million, to implement the first phase of the project.

The ATMs, to be known as Visa Banking Centers, will be installed in financial institutions and selected retail sites and will give customers around-the-clock access to their checking, savings and other financial accounts through the use of new Visa debit cards or proprietary debit cards issued by the participating financial institutions.

— — —

Harris Data Service, Inc. has formed a new division for the management and development of its software product distribution network.

The firm is seeking additional software support companies as charter members of its network with a ceiling placed at 50 members.

Currently, 30 independent member firms market Harris Data products.

Put these IBM terminals to work tomorrow.

Lease them from GE today.

You can't beat the IBM 3101 display terminal for bright clear displays and an outstanding array of terminal functions. Or the compact IBM 3232 Model 51 for crisp, quiet printouts. They're easy to set up . . . easy to operate . . . easy to service.

You can lease most any kind of data communication equipment from GE . . . modems, teleprinters, line printers, portable printers, CRTs, acoustic couplers, intelligent terminals and others. Call (800) 528-6050, Extension 406. [In Arizona, call (800) 352-0458, Extension 406.] Or call your nearby GE Leasing Service Center listed on this page.

GENERAL ELECTRIC

There's a nearby GE Leasing Service Center wherever you are.

Ala. Birmingham (205) 925-9449, Mobile (205) 479-6547 **Ariz.** Phoenix (602) 278-8515, Tucson (602) 294-3139 **Calif.** Los Angeles (213) 642-5340, Sacramento (916) 383-1324, San Francisco (415) 436-9260 **Col.** Denver (303) 320-3255 **Conn.** Southington (203) 621-4059 **Fla.** Jacksonville (904) 751-0615, Miami-Ft. Lauderdale (305) 940-7723 **Ga.** Atlanta (404) 452-4914 **Ill.** Chicago (312) 780-2994, Decatur (217) 424-8495 **Ind.** Evansville (812) 479-0248, Fort Wayne (219) 482-4506, Indianapolis (317) 241-9330 **Iowa** Davenport (319) 285-7501 **Kan.** Wichita (316) 945-0992 **Ky.** Louisville (502) 452-3311 **La.** New Orleans (504) 367-6529 **Md.** Baltimore (301) 332-4710 **Mass.** Boston (617) 938-1924 **Mich.** Detroit (313) 285-6700 **Minn.** Minneapolis (612) 522-4396 **Mo.** Kansas City (816) 231-6362, St. Louis (314) 965-7115 **Neb.** Omaha (402) 397-8657 **N.M.** Albuquerque (505) 262-1919 **N.Y.** Albany/Schenectady (518) 385-5518, Buffalo (716) 876-1200, N.Y.C. (201) 227-7900, Syracuse (315) 456-1073 **N.C.** Charlotte (704) 525-0311 **Ohio** Cincinnati (513) 874-8512, Cleveland-Akron (216) 441-6111, Toledo (419) 691-3501 **Okla.** Tulsa (918) 252-3634 **Ore.** Portland (503) 221-5095 **Penn.** Philadelphia (609) 488-0244, Pittsburgh (412) 462-7400 **Tenn.** Knoxville (615) 522-6770, Memphis (901) 527-3709 **Texas** Dallas-Ft. Worth (214) 243-1106, Houston (713) 672-3570, San Antonio (512) 349-4297 **Utah** Salt Lake City (801) 973-2253 **Va.** Richmond (804) 743-8181 **Wash.** Kent/Seattle (206) 575-2987 **W.V.** Charleston (304) 345-0920 **Wisc.** Milwaukee (414) 744-0110

IBM 3101 Display Terminal

IBM 3232 Model 51 Printer

Magnuson To Settle

(Continued from Page 107)

the firm were forced into bankruptcy.

The recent meeting was a continuing step in the process Magnuson has been undergoing for the past six weeks to work out satisfactory payment to suppliers.

Creditors were supposed to have chosen one of the four options available for payment by the June 2 date, Stephens said.

During the past several weeks Magnuson has whittled down the number of creditors from about 500 to 200.

The company did that in a two-tier way, first paying off suppliers who were owed less than $400.

The next step was making payments to those suppliers who were owed between $400 and $1,600, Stephens explained.

The four options that have been presented to the remaining creditors were as follows:

- Cash discounts — The firm will pay $1,600 plus 25 cents on the dollar up to the amount owed.
- Inventory return.
- Suppliers agreeing to purchase Magnuson equipment as upgrades to their systems.
- Acceptance of a noninterest bearing note payable in full in March of 1984.

The low turnout at the meeting reportedly was because creditors already understood the options available.

Stephens said the payment plan was devised by the company, its bank and major creditors.

Now, compatibility means a lot more than just a plug for our competition.

Introducing the Nixdorf 8890, the first complete family of computer systems to outclass the 4300 in speed, capability and savings.

This is the new Nixdorf 8890, the first complete single-source alternative to 4300 systems. It's a total system, both hardware and software. But more important, the 8890 is a better performing system for the price.

To start with, the 8890 is more powerful than the 4300, with unique multiprocessors for simultaneous processing in the CPU. This means faster processing, greater throughput and increased productivity. The entire family of processors and memory units are field-upgradable, so you don't replace the 8890 as your needs grow. Its modularity makes expansion easy, both for CPU and I/O capacity.

Each 8890 is a complete system, with everything you need . . . hardware, software, services and support . . . serving equally well in centralized, dedicated and distributed processing environments. Because of its compatibility, our field-proven operating system, NIDOS/VSE, protects your investments in software and peripherals and gives you a powerful base on which to build.

Additional Nixdorf software products provide all the tools you need for program development, data base management, on-line processing control and distributed information processing, all fitting into the DOS/VS(E) environment.

It all fits into your budget, too. The 8890 could cost 30% less than the comparable system.

And when you go with Nixdorf, you can feel comfortable knowing we have over 85,000 computer systems installed worldwide and one of the largest field service organizations in North America with over 120 offices.

For more details on the compatible *and* competitive 8890 family of computer systems, write: Nixdorf Computer Corporation, 300 Third Avenue, Waltham, MA 02154.

NIXDORF
COMPUTER

Nickels & Dimes

Integrated Office Systems has secured over $4 million in its first round of financing. Investors include Bessemer Venture Partners; Hambrecht & Quist; Asset Management Associates; Merrill, Pickard, Anderson & Eyre; Institutional Venture Partners; Matrix Investment Partners; Arscott, Norton & Associates; and C.M. Capital.

$ $ $

Applied Data Research, Inc. has declared a 5% stock dividend for all shareholders of record on June 14, payable on June 30, 1982. Applied Data's domestic bank line with the Girard Bank of Philadelphia was recently increased from $5.5 million to $8 million.

$ $ $

Rand Information Systems, Inc. declared a one-for-three reverse stock split of the firm's outstanding common shares, effective on the day of its annual meeting, subject to ratification by the shareholders. The company will also increase the authorized shares after the split to four million.

$ $ $

Management Assistance, Inc. (MAI) has reached an agreement with **Continental Telecom, Inc.** to acquire the option to purchase all of the 1,288,200 shares of MAI stock currently held by Continental for $2.5 million. Continental will not acquire any additional shares of MAI stock, solicit proxies or sell the shares of MAI stock subject to the option. The option is exercisable at $16.98 per share between Nov. 15 and Nov. 30, 1982. MAI can extend the option until March 30 upon payment to Continental of an additional $583,000.

$ $ $

Magnetic Controls Co. has declared a three-for-two stock split, in the form of a 50% stock dividend payable June 23, 1981, to shareholders of record June 9. The dividend will increase the outstanding stock to 3,803,699 shares.

$ $ $

Management Science America, Inc. has announced the public offering of 710,000 shares of common stock at $21.25 per share. Of the total, 250,000 shares are being sold by the company; the remaining shares are being sold by certain shareholders.

$ $ $

The Software Authority has obtained $500,000 in additional funding from Oscco Ventures of Menlo Park, Calif.

$ $ $

Lifeboat Associates has received an undisclosed amount of additional funding from Bessemer Venture Partners of New York and Oak Investment Partners of Westport, Conn.

$ $ $

Informatics General Corp. common stock will begin trading on the New York Stock Exchange on June 7, 1982. Approximately 3.4 million shares formerly traded in the over-the-counter market will be transferred to the exchange, and an additional one million shares will be available for stock options.

$ $ $

The David Jamison Carlyle Corp. has obtained a new increased credit line from Security Pacific National Bank in the amount of $10 million.

Directory Lists DP Purchasers

HUDSON, Mass. — *The 1982 Directory of Systems Houses and Computer OEM's* has recently been released here by Sentry Database Publishing.

The directory contains detailed marketing information about the buyers of equipment. It is indexed and cross-referenced by geographic location, application expertise and suppliers.

The new edition reports that sales of minicomputers and microcomputer peripheral devices to OEM's rose dramatically in 1981, citing that a total of over 270,000 peripherals were purchased — more than double the 1980 figure.

Leading the market were teleprinters, which posted a fivefold increase to 27,663 units in 1981. Digital Equipment Corp.; Texas Instruments, Inc.; and Seimens Corp. topped the field in total teleprinter sales, according to the reference directory.

The 677-page directory is available for $397 from Sentry Database Publishing, 5 Kane Industrial Drive, Hudson, Mass. 01749.

Introducing Hot Buttons.™

New extra-convenience features for terminal versatility.

We developed our new Model 16, 24-line x 80-column smart terminal to set a new standard in convenience. The result is Hot Buttons: exclusive design characteristics which provide unparalleled flexibility and operator authority.

A. Change the functions. Design the page.

Don't let your keyboard design dictate to you. Tell it what to do. Better yet, tell it what to be. For example, if you don't need the "↑" cursor control key, change the key function so that it becomes a "½". Or a "Σ". Or any other character, sequence or function. Any of the thirty-two keys in the top row or numeric pad (excluding the "STATUS" key) can be recoded to be any other key you prefer.

But, there's more. This new "user definable" characteristic also allows you to determine logical line and page length.

For the first time, you're master of both the keyboard and the display. Boss it around.

B. Clock yourself.

Tell the time, right from the terminal screen. This Hot Button feature provides accurate, digital printout of the time of day or elapsed time. Use it to keep a concise work log. Or just to keep your own important schedule. Time does pass, but with the Model 16, it doesn't have to go unnoticed.

C. Calculate the difference.

Add, subtract, multiply, or divide. Whatever your office calculator did for you before, the Model 16 Hot Buttons do for you now, with convenient display on line 25. Reduce work station clutter by eliminating the need for additional equipment. Keep accounting capability at your fingertips.

Comfort, flexibility and reliability.

That's what you really want in your terminal. And that's what Teleray's Model 16 delivers. You get all the innovative ergonomical and functional features of our previous models. Full editing capability. ANSI X3.64 compatibility. Plus four pages of display, horizontal and vertical scrolling capability, line and mosaic graphics, and Hot Buttons—unique characteristics that make our Model 16 the smartest terminal in its class. All standard. Designed for convenience. Designed for you.

Call or write for more information or a no-obligation demonstration. Phone 612-941-3300.

The Model 16 with **Hot Buttons.**
Push a few.

TELERAY
DIVISION OF RESEARCH INC
BOX 24064 MINNEAPOLIS, MINN. 55424

NEW LIFE FOR *1401* PROGRAMS

CS-TRAN converts your 1401 *object* programs to COBOL for the mainframe or mini of your choice.

CS-TRAN is the *only* translator that accepts your object programs, patches and all, yet allows you to include actual COBOL paragraph names and record definitions.

If you'd like more details about new life for your 1401 programs just call or write Russ Sandberg.

C-S Computer Systems Inc.
200 South Main Street, P.O. Box 356
Manville, NJ 08835 • 201-526-9000

Executive Corner

• Fred A. Snow has been appointed president and chief operating officer of Vector Graphic, Inc.

• Craig Benjamin has been named executive vice-president of marketing for Western Business Computers, Inc.

• Lewis Solomon has been elected senior vice-president and executive assistant to the chairman of General Instrument Corp.

• Donald G. Heitt has been named vice-president of marketing for General Automation, Inc.'s Computer Division.

• Robert W. Mayberry has been elected vice-president of Insurance Data Processing, Inc.

• Lester J. Limbaugh has been promoted to vice-president, product development, of Harris Corp.'s Computer Systems Division.

• Richard R. Allen has been appointed vice-president of finance at Data Systems Design, Inc.

• Eugene W. Helms, Robert M. Lockerd, William B. Mitchell, Timothy B. Smith, Donald P. Bynum, William J. Turner and David D. Martin have been elected assistant vice-presidents of Texas Instruments, Inc.

• Robert W. Reedy has been named vice-president of marketing for Recognition Equipment, Inc.

• Walter J. Ives has been promoted to vice-president, telecommunications research and development, at Hitachi America, Ltd.

• As part of a major reorganization, Ctec, Inc. has announced the following appointments: Phil Kiviat, vice-president and director, Systems Product Division (reappointment); Samuel L. Gravely Jr., vice-president, planning; Dean Hartwick, vice-president and director, Customer Programs Division; Dave Perlstein, assistant vice-president and director, Technical Services Division; Mike McDermott, assistant vice-president and director, Financial Division; and Howard Fitzhugh, assistant vice-president and director of administration.

• Louis W. Abbott has been appointed executive vice-president of Wavetek Corp.

• Kent Mueller has been appointed vice-president and general manager for Capex Corp.'s new sales division.

New Companies

Base 8, Inc. is a new firm providing consulting, analysis, design, programming, implementation and maintenance services for data processing. It is located at Suite 302A, 6920 Miramar Road, San Diego, Calif. 92121.

Celtic Technology, Inc. is a new company specializing in the development, manufacture and sale of computer graphics peripherals that transform video signals into photographs. The company is located at 20331 Celtic St., Chatsworth, Calif. 91311.

LDJ Computer, Inc. is a firm offering design, consulting and software solutions. **LDJ Electronics, Inc.** provides production monitoring equipment with complete scrap, efficiency/utilization, nonproductive/productive time analysis, line inventory control and blanket release scheduling. Both firms can be reached at P.O. Box 219, Troy, Mich. 48084.

'We've Got to Move Fast. Our Competition Has a New Floppy Disk That Doubles as a Frisbee.'

Computer Associates To Acquire Capex Corp.

JERICHO, N.Y. — Computer Associates International, Inc. has entered into a letter of intent with Capex Corp. to buy all of the outstanding shares of capital stock of Capex in exchange for 1.2 million shares of Computer Associates common stock. Based on recent trading for Computer Associates, the purchase price of the acquisition is about $22.5 million.

Both are developers of systems software. Computer Associates' primary product line is for the IBM DOS environment, while Capex products are geared to the IBM OS environment. Their products, the firms said, could be readily integrated.

Moreover, Computer Associates, which derives more than half its revenues from overseas markets, said it will have a ready outlet for Capex products.

Computer Associates had revenues of $28.4 million last year, with net earnings about 10% of sales. Capex, a privately owned company, had revenues for its latest fiscal year of $15 million. Computer Associates claimed the acquisition would make the firm the third largest in the software industry.

Capex is based in Phoenix and has 250 employees in 14 U.S. offices and five overseas offices. Computer Associates has 380 employees in six U.S. and 21 overseas offices.

Today we'd be crazy to introduce another microcomputer.

Unless it has better software.

With SuperCalc* SuperSheet,* the Monroe OC 8820 stands out from the confusing crowd of microcomputers.

The most advanced electronic worksheet at your fingertips.

We started out with the best software available for numerical analysis and report generation. Then we made it better.

Monroe's SuperCalc SuperSheet is an electronic worksheet that can perform a variety of tasks, from sales forecasts to "what if" analyses, without the need for repetitive entering and calculating.

MONROE GIVES YOU MORE TO WORK WITH.

Feature	VisiCalc*	Monroe SuperCalc SuperSheet
Partial Worksheet Retrieval	No	Yes
Individual Column Widths	No	Yes
Help Screens	No	Yes
Data Protection	No	Yes
Wide Label Capacity	No	Yes
60K Worksheet Memory	Yes†	Yes
Fast Scrolling	Yes	Yes
Advanced Video	Yes	Yes

†Not available on most machines. VisiCalc® is a registered trademark of VisiCorp.

And SuperCalc SuperSheet is part of a complete software library that's designed to help you work more effectively.

Better hardware to run better software.

Designed for today's competitive business environment, the Monroe OC 8820 has greater operating potential than most microcomputers. Our 128KB RAM gives you larger worksheets, while 640KB of built-in disc memory gives you greater project storage capability.

The OC 8820 is designed for business people, with its standard typewriter keyboard and calculator pad. Just about everything you need comes in the self-contained unit.

Service that's really "at your service."

Behind every OC 8820 is a 350 branch service/support network. Whether you buy one machine or one hundred, you're just a phone call away from a service and support force trained to strict Monroe standards.

Find out how Monroe's harder-working business computer system can work for you. Call or send in the coupon today.

*SuperCalc and SuperSheet are trademarks of Sorcim Corp.

CALL TOLL-FREE
800-526-7843 EXT. 444
(IN NEW JERSEY CALL: 800-522-4503 EXT. 444)
OR CALL YOUR LOCAL MONROE BRANCH OFFICE.

Monroe Systems For Business
The American Road
Morris Plains, New Jersey 07950

☐ Please send me more information on your computer.
☐ Please have a Monroe representative call me.

NAME
TITLE
COMPANY
ADDRESS
CITY STATE ZIP
PHONE
COW 6/14

Litton MONROE SYSTEMS FOR BUSINESS

Orders & Installations

Tymshare, Inc. has been awarded a multiyear contract by Western Electric to provide computer and support services for planning activities. The contract is valued in excess of $20 million.

Cray Research, Inc. will install a two-million word Cray-1S/2300 system, valued at $11.14 million, in France in the third quarter of 1982. The system will be used by a French government agency for scientific research.

Electronic Data Systems Corp. has signed a five-year facilities management contract with the Capital Savings and Loan Association, Olympis, Wash., to provide data processing and data center management.

Northern Telecom, Inc. has installed an SL-1 business communications system at S.C. Johnson & Son, Inc.

Liggett & Myers Tobacco Co., Inc. has purchased 53 Datalynx/3780 protocol converters from Local Data Co. to upgrade the remote print speeds at its tobacco product warehouses throughout the U.S.

Cincom Systems, Inc. has installed its Total Information System (TIS) at Anaconda Aluminum's Mill Products Division, the Wehr Corp. in Milwaukee and at Unilever, Hamburg, Germany. Bon Genie, a European fashion retailer, has installed Cincom's Series 80 TIS; and the Cincom Series 80 Mantis has been installed at Magic Chef Co., Cleveland, Tenn.; and at the G.O. McFaddin Co. in Memphis, Tenn.

Smallframe Systems, Inc. has installed the largest IBM Series/1 data base system in the country, with over 1G bytes on-line. The system is being used by Statewide Information Systems of Tustin, Calif., for the management of public record legal information. The data base spans four Control Data Corp. 240M-byte storage module drive disks and one 63M-byte mini-module drive disk, managed by Smallframe's virtual keyed access method. Twelve terminals are on-line to two million items, available for direct inquiry, update, deletion or addition.

Management Recruiters International, Inc. (MRII) has purchased Hewlett-Packard Co.'s HP 125, which will be used in conjuction with programming provided by Systems Analysis, Inc. to serve MRII's network of company-owned and franchised offices throughout the country.

Hartford Hospital has signed an agreement with the National Electronic Information Corp. to utilize its electronic Health Claims Distribution System, a national computer network of health care institutions and private insurance companies.

Commercial Software, Inc. has signed a contract to install its Cadets telemanagement software system in the Phillips Petroleum Co.'s Bartlesville, Okla., headquarters.

Computer Language Research, Inc., a firm specializing in computer services and computerized tax returns, has added the Intertel 90/10 system to monitor all data communications lines between the company and its clients throughout the world.

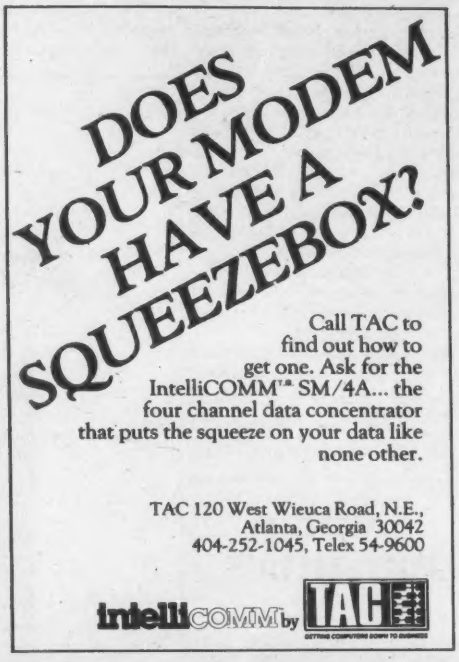
CSP, Inc., manufacturer of array processors, and Gould, Inc., S.E.L. computer systems division, have reached an agreement to continue their OEM relationship for two more years.

McDonnell Douglas Automation Co. (Mcauto) has signed an agreement with Data General Corp. for the sale of five Mcauto Unigraphics computer-aided design and manufacturing systems that will help DG streamline its computer design and manufacturing operations.

MSI Data Corp. announced a chainwide sale of a hand-held portable data entry computer system to Eckerd Drug Co. of Clearwater Fla. Eckerd, a division of Jack Eckerd Corp., has more than 1,200 stores in 16 states.

Contracts & Pacts

Altos Computer Systems, Inc. will supply Control Data Corp. with 3,000 to 5,000 16-bit Unix-based microcomputers under the terms of a five-year contract valued at from $30 million to $50 million. The first shipments are scheduled for the fourth quarter of 1982.



SuperBrain II™

Summa Cum Laude!

Just three years ago, Intertec stunned the microcomputer industry when its SuperBrain™ desktop computer graduated with honors . . . outperforming all the others by achieving the best price/performance ratio in its class. Today, that scholastic achievement remains unchallenged. At least until now. . .

Announcing SuperBrain II™. . . our latest microcomputer marvel that's destined to be the "Most Likely to Succeed" in the Class of '82. With thousands of SuperBrains in use worldwide, it's no surprise that SuperBrain II users have given our new model the highest honors yet. Standard features include a powerful 64K of internal memory, a CP/M* operating system, a 24 line × 80 column display on a 12-inch non-glare screen, a full-featured ASCII keypad with operator convenience keys, twin Z80 processors and dual RS-232 communications and printer ports. But SuperBrain II outsmarts its Class of '79 counterpart by offering *leaner* pricing, *more* features and *better* overall system performance. New SuperBrain II features include a faster, enhanced disk operating system, a library of new visual attributes including reverse video, below-the-line descenders and impressive graphics capabilities *and* Microsoft† BASIC — all included at absolutely no extra cost!

SuperBrain II's internal circuitry has also been completely redesigned and is now computer tested to ensure optimum field reliability. Plus, there are four new SuperBrain II models from which to choose, offering disk storage capacities from 350K bytes to 10 megabytes! But, best of all, prices start as low as $2,495, including software!

Of all the single-user microcomputers available today, our SuperBrain II is certainly in a class by itself. Not only does it outprice *and* outperform its competitive classmates, it's also backed by our comprehensive customer protection programs — depot maintenance, extended warranties, a satisfaction guarantee and a factory sponsored users group. All in all, the SuperBrain II™ represents the most incredible microcomputer value we've ever seen (or probably ever will see) in a long, long time.

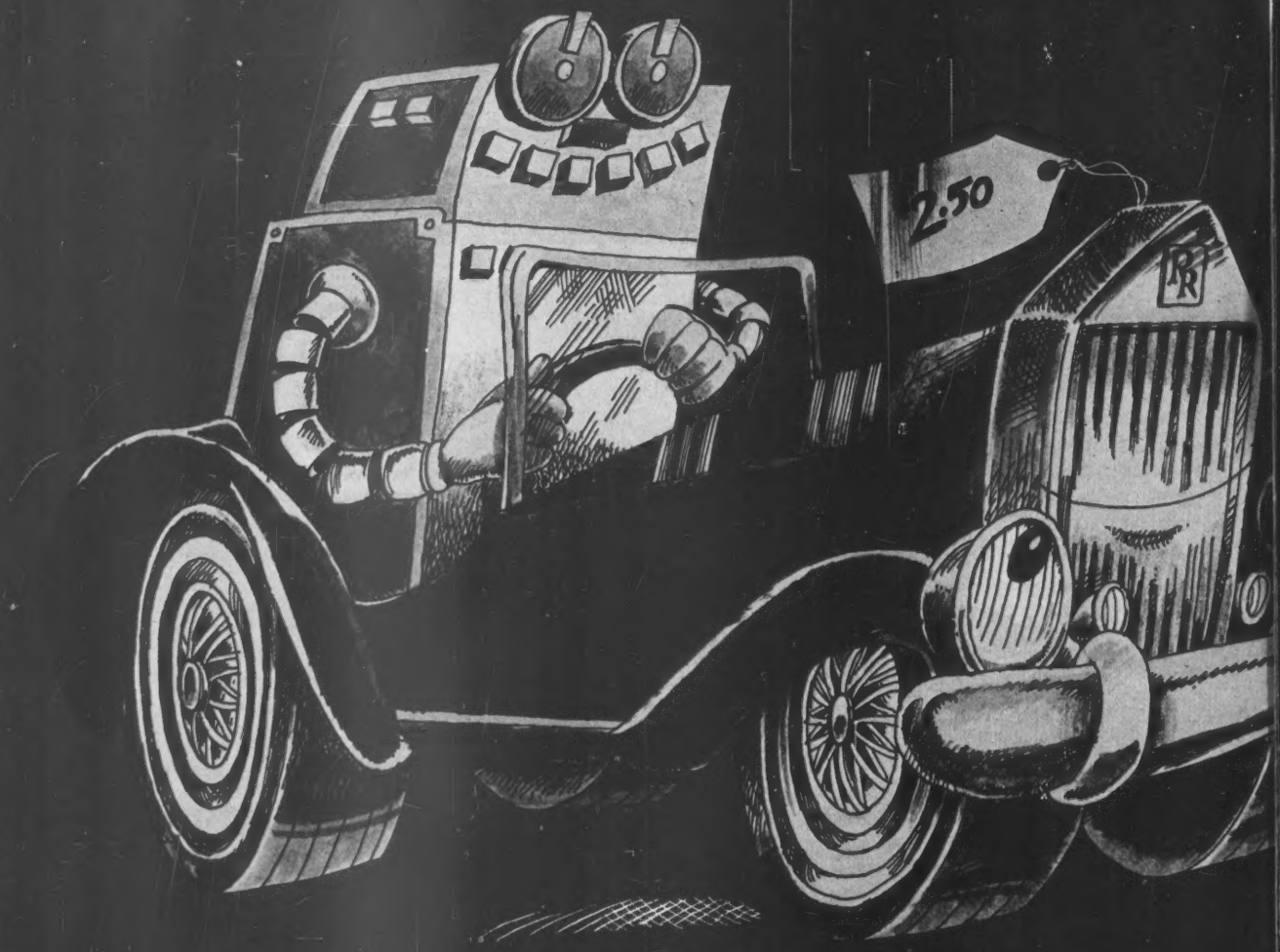
Contact your local dealer or call or write us at the address below for more information on our full line of single and multi-user microcomputers. Ask for our SuperBrain II "Buyers Guide" and find out why so many microcomputer buyers who insist on quality and value . . . insist on Intertec.

INTERTEC DATA SYSTEMS®

2300 Broad River Rd. Columbia, SC 29210
(803) 798-9100 TWX: 810-666-2115

*Registered trademark of Digital Research †Microsoft is a trademark of Microsoft Corporation.

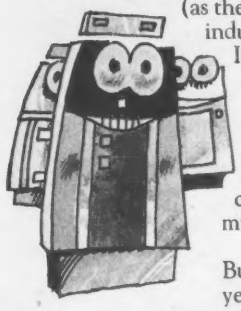
"If the auto industry had done what the computer industry has done in the last 30 years, a Rolls-Royce would cost $2.50 and get 2,000,000 miles per gallon."



Computers aren't just an industry, they're a revolution in the way mankind operates. And no one covers this revolution better than we do!

We are CW Communications/Inc. and despite our youth (only 15 years) we're the world's largest publisher of newspapers and magazines for computer people all over the world.

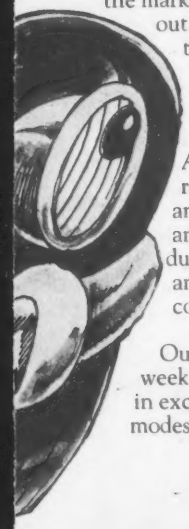
Most of our publications are weekly newspapers, because so many things happen so rapidly in the computer business (as the headline quote from a prominent industry executive makes so clear).



In only thirty years the industry has gone from the development of the giant Eniac system, through the tube-powered, water-cooled Univac I (the world's first business computer), to the incredibly cheap, battery-powered microprocessor.

But as unbelievable as the last 30 years have been, the next 30 will probably be even more incredible. In the next two years alone, installed power of general purpose computer systems will grow almost as much as it did in the previous 16 years. And the supercomputers of the 90's will transfer data at a rate several hundred times faster than even today's speedy computers! It's hard to remember this is real science, not fiction.

This extraordinary increase in efficiency has led to a rapid expansion in computer use, as human ingenuity finds more and more applications for these powerful tools. So the market for computer products and services has turned out to be more elastic than most observers had thought. Worldwide expenditures are currently at $90 Billion, and growing by 20% a year.



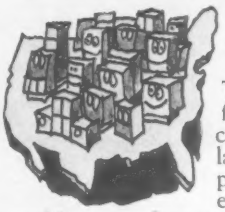
A constant flow of new products; rapid changes in technology; more and more new applications; and large and growing expenditures. It's an industry with a strong need for current, complete and accurate information. Which is where we come in.

Our oldest publication is *COMPUTERWORLD*, a weekly newspaper with a growing all-paid circulation in excess of 114,000 (quite an increase from our modest 7,500 in 1967).

COMPUTERWORLD serves America's computer users with the consumer-oriented, objective information they need. And it has become America's top business/professional publication, measured by advertising revenue.

COMPUTER BUSINESS NEWS is our weekly newspaper for executives in the U.S. computer industry whose organizations are involved in the manufacture, integration and resale of computer systems. This is a relatively new marketplace which has grown up around the minicomputer and microcomputer, and which shows every sign of very rapid growth for at least the next decade.

The latest phenomenon of the computer industry is personal and desk-top computers and we're covering it with our newest publication, *INFOWORLD*. We report from the user's point of view — with product ratings, and information on using small computers in business and at home. It's a paid circulation, weekly newspaper, and the only publication of its type — located right in the middle of silicon valley — where it's all happening.



The United States alone accounts for nearly half of the worldwide computer market, but billions of dollars are spent by foreign computer people for American-made computers and computer products. And our publications penetrate those marketplaces, too.

We are publishers of newspapers and magazines in the following markets: Australasia, West Germany, United Kingdom, The People's Republic of China, Japan, Brazil, Mexico, France, Spain and Denmark.

And we provide U.S. advertising representation and editorial services to publications in the following countries: Italy, Greece, The Netherlands, Sweden, Argentina, Chile, Southeast Asia and Kuwait.

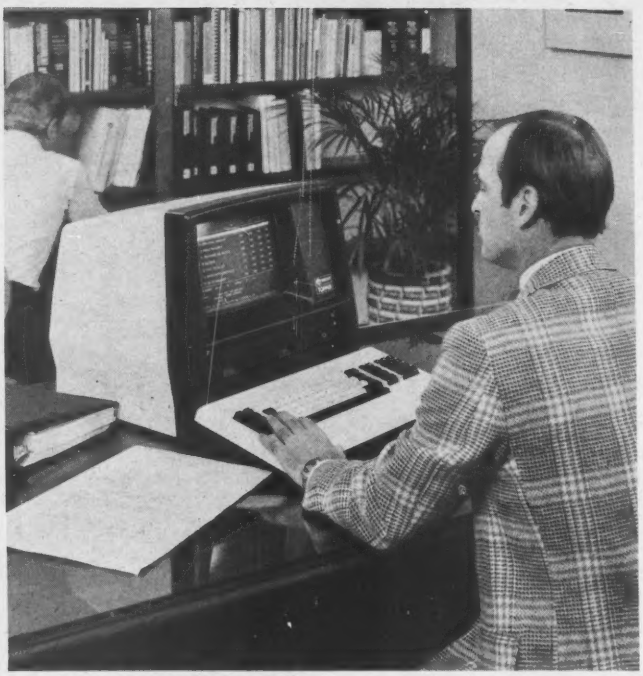
Our International Marketing Services Department can give you one-stop advertising service for any or all of these publications — including translation and production services. We'll even bill you in U.S. dollars, so it's as easy as advertising in U.S. publications.

Computing is an exciting industry, with a unique need for information. And the publications we produce provide that information to hundreds of thousands of computer people around the world. They are excellent vehicles for reaching these people with your advertising message, and we'd be happy to give you more information on any of them. Just call or write, Roy J. Einreinhofer, *Vice President, Marketing.*

CW COMMUNICATIONS/INC.

375 Cochituate Road, Box 880
Framingham, MA 01701 (617) 879-0700

HERE COMES THE TOPPER



As necessary in the HOME . . . As in the OFFICE

A Telecommuting Console for 3270 Networks

TOPPER® is here! Designed for use in both the home and office, TOPPER® is the ideal personal automation system for those whose inspiration is not limited to a 40 hour week. Beehive's new CP/M based Telecommuting Console for IBM 3270 networks has twin, half megabyte floppies and a full 12″ screen. It's powerful enough for the big jobs, yet compact enough for comfortable desk top operation.

Combined with a BSC or SNA protocol converter, TOPPER® can be connected locally or by phone lines to your IBM mainframe. Used off-line it serves as your personal console for data collection and processing. Used on-line it works like a standard IBM 3278 or personal RJE station. It even provides a window to the world's databases when used as a low cost asynchronous timeshare computer terminal.

Priced at $2995, TOPPER is a productivity bargain. And as the big brother to more than 115,000 Beehive terminals installed worldwide, TOPPER means quality performance. We back that claim with a *one year factory warranty.*

Start Telecommuting right away. Make working at home your competitive edge.

DISTRIBUTOR INQUIRIES INVITED

California, Costa Mesa ..... (714) 540-8404
California, Sunnyvale ..... (408) 738-1560
Florida, Altamonte Springs .... (305) 788-9000
Illinois, Arlington Heights ..... (312) 593-1565
Massachusetts, Woburn .... (617) 933-0202
Missouri, Independence ..... (816) 356-4402
New York, New York ..... (212) 922-1275
Texas, Dallas ..... (214) 239-3330
Washington, D.C. ..... (703) 356-5133

BEEHIVE INTERNATIONAL® TOLL FREE **(800) 453-9454**

"Increasing Knowledge Worker Productivity"

HEADQUARTERS: 4910 Amelia Earhart Drive·Box 25668·Salt Lake City, Utah 84125·(801) 355-6000·TWX 910-925-5271

EUROPE: Gebouw 70, Kamer 134·1117 AA Schiphol·The Netherlands·Phone 020-451522·Telex 15284

POSITION ANNOUNCEMENTS

SERVICE

No one offers you more than NCA.

Success in computer career advancement results from a wide variety of specialized services, skillfully performed. Anyone who offers you less greatly diminishes your chances of achieving professional growth.

At NCA we offer a great many services, each of which is designed to control a specific aspect of the employment process. Collectively they produce the impact that is required to achieve meaningful advancement. Services are, of course, no better than those who perform them. That is why, at NCA, each of our personnel consultants have been thoroughly trained, and have acquired the experience necessary, to perform all of our specialized services with maximum skill.

Don't accept less than the best. Contact the NCA firm nearest to you. Or mail your resume. You'll be pleasantly surprised at the variety of our services and at our skill in performing them. Confidentiality is assured. Employers pay our fees. Service . . . no one offers you more than NCA.

ATLANTA: BAI Limited
229 Peachtree Street, Suite 1601-C
Atlanta, Georgia 30303 (404) 581-0040

BOSTON: Robert Kleven and Co., Inc.
North Brook Park, Suite One, 181 Bedford Street
Lexington, Massachusetts 02173 (617) 861-1020

CHICAGO: Thos. Hirtz & Associates
150 N. Wacker Drive, Suite 1700
Chicago, Illinois 60606 (312) 977-1555

CLEVELAND: Professional Staffing Systems, Inc.
4807 Rockside Road, Suite 300
Cleveland, Ohio 44131 (216) 524-5500

COLUMBUS: Michael Thomas, Inc.
65 E. Wilson Bridge Road, Suite 201
Worthington, Ohio 43085 (614) 846-0926

DALLAS: DataPro Personnel Consultants
12720 Hillcrest, Suite 520
Dallas, Texas 75230 (214) 661-8600

DENVER: EDP Infinity, Inc.
P.O. Box 2468
Littleton, Colorado 80161 (303) 850-5490

DETROIT: Electronic Systems Personnel, Inc.
3000 Town Center, Suite 2580
Southfield, Michigan 48075 (313) 353-5580

FLORIDA: Data Sciences Personnel, Inc.
P.O. Box 8577
Hollywood, Florida 33024 (305) 434-6112

HARTFORD: Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105 (203) 549-4240

HOUSTON: Career Consultants, Inc.
2000 South Post Oak
Houston, Texas 77056 (713) 626-4100

INDIANAPOLIS: Computer Personnel Services, Inc.
107 N. Pennsylvania
Indianapolis, Indiana 46204 (317) 634-4712

LOS ANGELES: Constellation Enterprises
3250 Wilshire Boulevard, Suite 607-K
Los Angeles, California 90010 (213) 487-0616

MILWAUKEE: EDP Consultants, Inc.
11430 W. Bluemound Road
Milwaukee, Wisconsin 53226 (414) 475-0077

MINNEAPOLIS: Electronic Systems Personnel
858 Twin City Federal Tower, 121 S. 8th St.
Minneapolis, Minnesota 55402 (612) 338-6714

NEW JERSEY: Systems Search
2040 Millburn Avenue
Maplewood, New Jersey 07040 (201) 761-4400

NEW YORK: Botal Associates, Inc.
7 Dey Street, Suite 410
New York, New York 10007 (212) 227-7370

NEW YORK UPSTATE:
CFA Associates Personnel, Inc.
2530 James Street
Syracuse, New York 13206 (315) 463-5225

NORTH CAROLINA: DataMasters,
Div. of TaskForce, Inc., P.O. Box 6888
Greensboro, North Carolina 27405
(919) 373-1461

PHILADELPHIA: Systems Personnel, Inc.
115 West State Street
Media, Pennsylvania 19063 (215) 565-8880

PHOENIX: Professional Career Consultants
3521 North Central Avenue
Phoenix, Arizona 85012 (602) 274-6666

SAN DIEGO: Electronic Systems Personnel Agency
2607 First Avenue
San Diego, California 92103 (714) 239-0811

SAN FRANCISCO: The Computer Resources Group, Inc. Agency, 303 Sacramento Street
San Francisco, California 94111 (415) 398-3535

SEATTLE: Houser, Martin, Morris & Associates
1940 116th Avenue N.E.
Bellevue, Washington 98004 (206) 453-2700

WASHINGTON D.C.: ESP Systems Corporation
914 Lamberton Drive
Silver Spring, Maryland 20902 (301) 649-6171

National Computer Associates

OPERATING SYSTEMS ANALYST

Pacific Power & Light Company, the largest electric utility in the Northwest, is currently looking for a qualified person to fill an Operating Systems Analyst position in our Computer & Technical Services Department.

Position requires college-level course work in computer science, or the equivalent in training and experience. Qualified candidates **must** have a minimum of 3 years experience supporting CICS under MVS and must be familiar with ACF/VTAM.

If qualified, please send resume and salary requirements to Pacific Power & Light Company, Corporate Employment, A-5-82-87, 920 S.W. 6th Avenue, Portland, Oregon 97204.

The People at Pacific Power.

An Equal Opportunity Employer

DP PROFESSIONALS
San Francisco

The information explosion has created an unusually good opportunity for skilled talents to contribute to application systems development. Let us explore a career match for you with our clients.

INDUSTRIES

Classical and Process Manufacturing; Retail; Distribution; Banking.

ENVIRONMENTS:

IBM S/370 Model 135 through 3033; DOS/VS, OS/VS, DBMS, Communications, Interactive, Computing, COBOL, PL/1, ALC.

JOB TYPES:

Programmers, Analysts, Project Leaders, Systems Programmers, Data Base Analysts.

We are consultants to management. For immediate and confidential consideration, please send detailed resume to:

CW-A3261
Computerworld
Box 880
Framingham, MA 01701

Employer assumes fee.

PROGRAMMER ANALYST

Red Lobster Inns, the nation's largest full-service seafood restaurant chain, has an immediate opening for a Programmer Analyst in our Corporate Office in Orlando, Florida.

WE OFFER:
- Excellent starting salary
- Excellent benefits
- Opportunity for promotion and continued career development

We are seeking a data processing professional with strong analytical skills coupled with the ability to work independently to support application oriented systems.

The successful candidate will be self motivated, have excellent interpersonal skills and exposure to systems design and project leadership.

Extensive experience in COBOL programming, VM/370 and OS/MVS is required. Program development experience using CMS is desirable.

If you qualify, send your resume with salary history to:

Red Lobster®
INNS OF AMERICA
Dept. DJP/PA
P.O. Box 13330
Orlando, FL 32859

An Equal Opportunity Affirmative Action Employer M/F/H/V

position announcements | position announcements | position announcements | position announcements | position announcements

GEARHART
THE GO COMPANY

We Are An Equal Opportunity Employer M/F

INFORMATION SYSTEMS PROFESSIONALS
TEXAS OPPORTUNITIES - SERVING THE OIL INDUSTRY

Gearhart Industries, Inc. is internationally known for providing oil well evaluation equipment and services. Headquartered in Fort Worth, Texas, we have a work force of over 5,500 and operations in more than 7 countries. We attribute our rapid growth to the hard work and talent of our employees and structure our positions to reward quality performance. If you are interested in working for a company which promotes and develops career opportunities for technical professionals, consider one of the openings we now have available in our Information Systems group:

DATA COMMUNICATIONS SUPERVISOR
Must have in-depth knowledge of TP hardware, line protocols, monitoring equipment, network planning and network control. SNA experience is desirable.

DATA BASE ANALYST
Will perform data base generations, tuning and space management tasks to support application development. Requires a minimum of 4 years of DP experience, with 2 years data base background.

DATA PROCESSING OPERATIONS ANALYST
Will perform studies and coordinate such items as: Hardware planning, disaster recovery, operations turnover methods, job scheduling, analysis of key entry equipment and performance recording.

PROGRAMMER/ANALYST
Should have experience in manufacturing applications (COMSERV'S AMAPS system) or Order Processing systems. You should also have proven technical skills in COBOL, and familiarity with IMS/DB and CICS is desirable.

We are running MVS/JES 2, IMS/DB and CICS on an IBM 3081.

Gearhart Industries, Inc. offers excellent salaries and a work location in one of the most rapidly growing cities in Texas. Our company benefits reflect an employee-oriented personnel policy which provides dental insurance, 10 paid holidays, a Profit Sharing Trust Plan, and a Stock Purchase Plan. If you are interested in a future of professional development and financial advancement, consider Gearhart Industries, Inc. Send your resume and salary history to:

Personnel Director
GEARHART INDUSTRIES, INC.
P.O. Box 1936
Fort Worth, Texas 76101
(No employment agency responses please)

Data Processing

Sr. Technical Consultant/RACF

1-800-821-7700
Ext. 608
Missouri Residents
Call 1-800-892-7655
Ext. 608

San Francisco Opening

If you're the type of person who sees things in a different light, and if you're waiting for a position that offers maximum visibility and recognition for your achievements, as well as good project-to-project mobility, consider a career with the Bank of America.

Our Electronic Banking Services Division, headquartered in San Francisco, needs a Sr. Technical Consultant capable of providing the technical leadership required for our RACF implementation program.

Your duties will include ensuring the proper and timely execution of the project and will involve implementation, problem identification and resolution, and preparation and maintenance of documentation. Additionally, you will participate in the research and evaluation of future storage technologies such as Cache Memory Controllers, Magnetic and Optical DASD, and Data Streaming Tape. Your background must include the following:

- **Solid data processing background.**
- **Project management skills.**
- **Excellent oral and written communication skills.**
- **Ability to relate to all levels of management.**
- **Technical knowledge of RACF.**

We offer competitive salary and benefits and relocation assistance. For confidential consideration, call our toll-free number, and send resume, including salary history and requirements, to: **Gwendolyn Gomez, Management Recruitment Dept. 3442-GGN, Bank of America, P.O. Box 37000, San Francisco, CA 94137.** An equal opportunity employer.

Where vision becomes reality...

BANK OF AMERICA

ADR - The first word in
SOFTWARE DEVELOPMENT

23 years of leadership have taught ADR just how valuable a good idea can be. It has also taught us that good ideas don't just happen. They come about when creative people are provided the tools and the incentives to produce them.

At ADR we think our record of accomplishment and growth should tell you a lot about our technical environment and even more about our incentives to produce.

The positions currently available involve assignments in software development for the following ADR products: **VOLLIE, LOOK, MetaCOBOL, IDEAL, DATACOM, ROSCOE, ETC, The LIBRARIAN and EMPIRE.** Applicants must have a minimum of 2 years programming experience with strong IBM/ALC skills.

Applied Data Research offers a compensation plan fully commensurate with your background and potential plus a comprehensive benefits package. For immediate consideration please forward your resume to Mr. E. Smith, Director of Technical Recruiting, Dept. CW-24.

APPLIED DATA RESEARCH, INC.
Rte. 206 & Orchard Rd., CN-8
Princeton, NJ 08540

Equal Opportunity Employer, M/F

ILLINOIS
PROGRAMMER ANALYSTS

OPPORTUNITIES UNLIMITED! Manufacturing and financial institutions in Chicago are finally receiving their IBM SYSTEM 38's. Looking for talented individuals with 3+ years in data processing and 6+ months exposure to RPG III. Stepping stone to management spots. $30,000.

Contact
Sandy White

ROBERT HALF OF CHICAGO, INC.
35 E. Wacker
Chicago, IL 60601
(312) 782-6930

PROGRAMMER/ANALYSTS
Stimulating Growth Opportunities in a Sophisticated Installation

Perform complete cycle of developmental activities from analysis to installation of complex real-time data base system on a Honeywell 6620. Need knowledge of systems design and Cobol programming. Outstanding opportunity for motivated self starters. Salary $21,381 - $29,211.

Oklahoma City offers outstanding benefits and performance review policy. To apply, send resume to:

City of Oklahoma City
Personnel Dept.
201 Channing Square, Room B-8
Oklahoma City, OK 73102
(405)231-2303

An Equal Opportunity Employer

Manager/Data Processing

Individual will assume management of data processing (IBM 4331, DOS/VSE environment, VSAM, CICS/DMS) for medium sized public school system. Responsibilities include department management, supervision of staff of four and DMS application and system design. Required: experience COBOL programmer, background in DMS applications and system design or CICS experience. RPG II and VSAM a plus. Salary range: upper 20's. Submit resume with references and salary requirements to: **Personnel Department, East Hartford Board of Education, 110 Long Hill Drive, East Hartford, CT 06108.**

An Equal Opportunity/Affirmative Action Employer.

PROGRAMMERS PROGRAMMER/ ANALYSTS

HARDWARE • SOFTWARE

If you have one or more years experience on any of the following:

- IBM 370/3033/4331/4341/8100 - VM/CMS/CICS/OS/VSI/MVS/DOS/VSE/VSAM - COBOL/ASSEMBLER/IMS
- HONEYWELL 6000 SYSTEMS/LEVEL/6/66/40 DUAL/IDS/DM4/COBOL/GCOS/GMAP
- UNIVAC 1100 (EXEC 8) OR 90 SERIES (OS 3) OS 1100 OR OS/3 INTERNALS DMS - 1100 - TIP/CMS/QLP/ASC 11 COBOL
- DEC - PDP 11/23/34/44/45/70 - VAX 11 780 RSX 11M-K RSTS/E - VAX VMS - MACRO - 11, BASIC 2, FORTRAN/ASSEMBLY LANGUAGE
- NCR 8550/8585/8200 - VRX/IMOS/STORE IV TRAN PRO - NEAT 3/COBOL ON LINE - SPECIAL NEED FOR CIF
- BURROUGHS 3890/4700/6700/6800 - ALL SOFTWARE NEEDED

and would like the most individualized job search in data processing today on a company fee paid basis, nationally, send your resume in confidence to:

SOUTHERN COMPUTER SERVICES
P.O. DRAWER 2679
SARASOTA, FLORIDA 33578
Toll Free 1-800-237-6701

FOX VIDEO GAMES
MANAGER SOFTWARE DEVELOPMENT

Fox Video Games is a rapidly growing designer and producer of innovative video entertainment that markets and distributes its product worldwide. We are seeking an individual with proven management experience and thorough knowledge of software development.
Responsibilities will include hiring, managing, and developing a group of software engineers in an exploding video game software business. Minimum 7-8 years management and software development experience. Attractive salary and benefits program. Please send resume to address below.

GAME PROGRAMMERS

Fox Video Games is seeking experienced video game programmers. Experience with ATARI or MATTEL systems preferred. Attractive salary and benefits program. If you are looking for an opportunity to innovate and excel, send your resume to:

FOX VIDEO GAMES
P. O. BOX 794
Saratoga, CA 95071

DATA PROCESSING PROFESSIONALS

DATA RESOURCE CORPORATION, headquartered in Atlanta, is a leader in quality Contract Programming and Consulting. Our continued growth in the Southeast and Southwest has created opportunities for versatile Professionals with state-of-the-art skills in Programming and Systems Design.
We are currently seeking individuals with at least 3 years of diversified programming experience, strong technical backgrounds, and who possess the desire to work in various, stimulating Data Processing environments. IMS and CICS skills are of special interest, as are the abilities to travel or relocate.
We can offer you competitive salaries and comprehensive benefits programs, including bonuses and profit sharing. If you've been searching for a growth opportunity with a dynamic and progressive company with a Management team that "puts people first," then DRC is your answer.
For immediate consideration, please call BECKY FINLEY COLLECT at (404) 633-9387, or send your resume to:

DRC
DATA RESOURCE CORPORATION
1849 Tullie Cir. N.E.
Suite 110
Atlanta, GA 30329
An EOE M/F

EDP OPPORTUNITIES

WANG VS, financial system development, 100+ terminals,...MBA.....$51M
SYSTEMS MGR, system 34, RPG 11, local/remote, mapics,...Degree Staff 10....$45M
SYSTEMS MGR, Wang VS, 100+ terminal, fin/spread sheets, cash flow.....Degree.....$43+M
P1/I Virtual system, 1.7 meg, Small co. Conn location...Excel growth.....$35M
LEARN I.M.S. 2 yrs OS Cobol exp nec, This co will train.....$33-39M+Bonus
SYSTEM/ANA Cobol DOS or OS user inter APP/DEV, learn MVS.....$33M
COBOL OS Program Learn CICS, company will train... Degree nec..Comp/Sci.....$33M
INSURANCE Actuarial Program, Fortran/PL/I, CP/CMS,...Degree Modelling.....$31-33M

Call Bill Borrelli (212) 349-3610
WM. HARRIS ASSOC.
150 Broadway agency NY, NY 10038

Help Build the Next Generation–At Wang

As the leader of the computer-driven Office Automation market, Wang stands 341st among the Fortune 500, with over a billion dollars in revenues. Wang is looking for more software development people to help shape the future of our state-of-the-art products.

Professional Computers

An opportunity for Software Engineers to join a small team working on the design/implementation of systems level software for the Wang Professional Computer. Background should include a minimum of 3 years in systems software design and implementation, including experience in micro-based operating system constructs (e.g. interrupts, resource allocation, scheduling). Hands-on development experience in Assembler and at least one of the following languages: PL/M, "C", Algol, PL/1 or Pascal necessary.

Office Automation

Data Base Management Systems – Construct state-of-the-art data dictionaries, query and data definition languages as tools to help end users solve problems.

Software Tools – Support system and application program development in Assembly and high level languages. Includes compilers, interpreters, assemblers, linkers, text editors, symbolic debugging aids, cartridge tape drivers and intelligent I/O drivers.

Word Processing Systems – Will participate in the development of Word Processing Systems Software. Requires 2-3 years systems programming background, familiarity with user interface environment and experience with "C", PL/M, Z-80, 68000 and 8080 assembler.

Senior Software Engineers – Needed to design/implement support functions and office applications for Wang's next generation Office Processor. Support functions include window control, multi-size font character generation, and graphics firmware for high resolution bit map CRT's. Requires 2+ years programming design experience including exposure to interactive business office automation applications.

Product Management

We seek a Senior Data Base Product Manager to plan and implement relational data base solutions based on the requirements of office automation and data processing. This highly visible position reports to the Director of Computer Product Planning and requires 5-8 years experience in the field of relational data base, a background in office automation/data processing, and an MBA or CS.

Business Graphics

Participate in the design and implementation of interactive color business graphics involving human engineering and integration of graphics with high-level language applications, data base management systems and word processing. Requires experience in development/use of end-user graphics facilities within a data processing environment. Projects include: business graphs, text charts, structure charts, interactive illustration, menu driven interfaces, thematic mapping and organization charts.

Leading the way in benefits.

Our continued growth and success allow us to offer one of the best benefit programs in the industry including profit sharing, stock plans, company paid dental, medical and life insurance and tuition reimbursement.

Contact us today.

Send your resume to Steve Pearl, Sr. Personnel Representative, Wang Laboratories, Inc., Dept. CW-614, MS-1106, One Industrial Avenue, Lowell, MA 01851.

We are an affirmative action employer.

WANG

The Office Automation Computer Company

EMPLOYMENT SERVICE FOR PROGRAMMERS AND ANALYSTS

National Openings With Client Companies and Through Affiliated Agencies

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support

Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees. We guide, you decide.

RSVP SERVICES, Dept. C
Suite 700, One Cherry Hill Mall
P.O. Box 5013
Cherry Hill, New Jersey 08034
(609) 667-4488

RSVP SERVICES, Dept. C
Suite 211, Dublin Hall
1777 Walton Road
Blue Bell, Penna. 19422
(215) 629-0595

RSVP SERVICES
Employment Agents for Computer Professionals

FLORIDA

SYSTEMS ANALYST

Top flight organization in Miami has urgent need for an Analyst with solid business design background. You must have a 2-year degree or more to qualify. No coding at this level! No travel involved and excellent benefits offered, in addition to IBM state-of-the-arts hardware. Judge for yourself! Relocation and fee paid.

Salary to 32,000.

HALF

Bonnie Gouz

ROBERT HALF OF MIAMI, INC.
2655 Le Jeune Road, Ste 814
Coral Gables, FL 33134
(305)447-1757

Give us your resume

We'll give YOU San Francisco!

Some people come to sail on the Bay, some to ski in the Sierras, and some to snorkle in Santa Cruz. But the professional climate is the real reason, and every bit as exciting.
There's nobody better qualified than CRG to introduce you to San Francisco. We've been here longer—over 10 years—know everyone in EDP worth knowing, and our list of client companies reads like the Who's Who of the business world.
Send your resume today, or call. All fees, interview, and relocation expenses are paid by our clients.

Computer Resources Group, Inc.
303 Sacramento St., San Francisco, CA 94111
(415) 398-3535 or 3333 Bowers Ave., Santa Clara, CA 95051,
(408) 727-1658

CRG AFFILIATES IN 27 MAJOR U.S. CITIES National Computer Associates

An employer-retained professional placement service

position announcements | position announcements | position announcements | position announcements | position announcements

SCT ON THE GROW

MEMO

TO: COMPUTING VIP's
FROM: SYSTEMS & COMPUTER TECHNOLOGY CORP.
RE: CHARISMA/STYLE/PRESENCE
DATE: ASAP

Time is too important to spend reading ads. SCT wants you to know...

- Our phenomenal growth requires more senior level management in our Operations, Marketing and Software Technical Divisions
- Relevant knowledge/experience in DP-related industries—hardware/software/services marketing, operations, facilities management, or technical development
- Track record essential; entrepreneurial style critical

Discreet, exploratory discussions initiated through John Brown, Director, Human Resources, (215) 647-5930, Great Valley Corporate Center, Four Country View Road, Malvern, PA 19355

Systems & Computer Technology Corporation
An Equal Opportunity Employer M/F

SCT

---

home petroleum

The Search Is On For ...
A PROGRAMMER/ANALYST

Home Petroleum is on the move. We're finding and producing oil and gas. This means growth for us and those who join us. We are relocating our data processing operation to Denver from Houston, which has created excellent ground floor EDP opportunities. We are searching for a programmer with oil and gas experience who is intrigued with solving complicated business problems through innovative means. We currently have an opening for the following position:

COBOL PROGRAMMER/ANALYST

The successful candidate will have the following qualifications:

- 2-3 years COBOL programming experience.
- Proficiency in DOS/JCL.
- At least 1 year of oil and gas experience.

In addition, any CICS COBOL command level experience or familiarity with Vollie, Librarian, Optimizer III, or Easytrieve is a plus. This individual will be involved in programming new applications and enhancement of existing applications in the areas of revenue/royalty, land records, accounts payable, and other energy related areas.

If you are interested in the above position and possess the required qualifications, please contact us. We offer a competitive salary structure as well as an excellent benefits package. Furthermore, true career growth based on your ability is yours at Home Petroleum.

We'll give your career a home in which to grow.

Send your resume and salary history in complete confidence to:

home petroleum

Corporate Recruiter
HOME PETROLEUM CORPORATION
999-18th Street, Ste 601-D
Denver, CO 80202
(303) 628-5000

An Equal Opportunity Employer
No Agencies Please

BUSINESS SYSTEMS ANALYST

National Medical Care is in search of a talented and creative Business Systems Analyst to design and implement information systems for our largest division's business operations.

We seek that rare individual who can evaluate, define and implement manual automated systems, interpret systems specs, and interface with MIS professionals. You'll report to the divisional management team, translating their needs into a solid DP system, and provide them with concise, accurate management reports pertaining to the operations of the division.

A minimum of two years experience in a business analyst role and a business degree is required. A health care, medical or financial systems background, as well as an advanced degree, is a plus.

This is a responsible, highly visible position that offers an excellent compensation package and room for professional growth towards general management. For an immediate and confidential review, call our Corporate Recruiter, Jon Curley, at 617/262-1200, ext. 261, or send your resume and salary requirements to:

nmc

An Equal Opportunity Employer M/F

Corporate Recruiter
NATIONAL MEDICAL CARE, INC.
John Hancock Tower
Boston, MA 02116

TEXAS

IBM PROG/ANALYST	$26-35,000
IBM SYS/ANALYST	$30-42,000
IBM SYS PROG	$35-45,000
IBM IMS DBA	$32-45,000
DEC 11/70 RSTS/E	$25-30,000

Contract Service Position Available.

Long Term Contract - Various Duties.

Send resume to:
JIM FLEMING

ROBERT HALF OF HOUSTON, INC.
720 North Post Oak Rd., #228
Houston, Texas 77024
(713) 688-1800

CONTRACT
Data Processors

Atlanta based consulting firm currently staffing projects in Atlanta and Sunbelt.

Drum/Donahue Inc.
6789 Peachtree Industial Blvd.
Suite 200
Atlanta, GA 30360
(404) 441-2165

KENTUCKY STATE UNIVERSITY
FACULTY POSITIONS
Computer Science/Data Processing

Applications and recommendations are solicited for several full-time faculty positions; available on or before August, 1982. Positions are to be filled as soon as possible. Applications will be accepted until the positions are filled. Salary and fringe benefits are competitive. Minimum qualifications include: Ability and interest in teaching computer courses on the undergraduate level and in teaching one or more standard programming languages. Masters degree in a relevant discipline. Experience in the subject area. **Send resume of qualifications and experience as soon as possible to Personnel Department, Kentucky State University, Frankfort, KY 40601, phones: (502) 564-6324 and 564-5867.**

An equal opportunity employer.

INDIANA UNIVERSITY

ADMINISTRATIVE COMPUTING
INVITES APPLICATIONS FOR PROJECT MANAGER,
CAPACITY PLANNING MANAGER,
ON-LINE SOFTWARE MANAGER,
TELECOMMUNICATION MANAGER AND ANALYST/PROGRAMMERS

The convenience of a small town, the excitement of a major university, the rewards of professional satisfaction/Join us and have the best of all worlds.

PROJECT MANAGER - We're looking for an experienced professional to take charge of a team of Analyst/Programmers engaged in the design, development, implementation, and maintenance of administrative on-line systems. RESPONSIBILITIES include providing technical leadership, planning and controlling the development of computer projects, preparing time and cost estimates for proposals, monitoring and reporting team progress and coordinating with users and operation staff during all project phases. QUALIFICATIONS include a Baccalaureate Degree and five (5) years of analysis and programming. Experience with structured systems design and advanced COBOL concepts; good communication skills expected. In addition, experience with on-line systems and VSAM file structures is desirable. Supervisory training/experience helpful.

CAPACITY PLANNING MANAGER - This new area needs a highly qualified manager with a broad background in providing technical direction for computing hardware and software. RESPONSIBILITIES including leading a team responsible for capacity management in a multiple CPU environment with word processing, distributed processing and data storage requirement. QUALIFICATIONS include a Baccalaureate Degree and five (5) years computing experience. An in-depth knowledge of capacity planning is required. Good communications and organizational skills are expected.

ON-LINE SOFTWARE MANAGER - We are looking for an experienced manager to take charge of a team of experienced Software Analyst/Programmers responsible for installing and maintaining state-of-the-art on-line software products. RESPONSIBILITIES include technical leadership, planning and controlling on-line software projects. QUALIFICATIONS include a Baccalaureate degree and five (5) years experience with on-line software packages. Experience with CICS, data base management systems, and word processing is highly desirable.

TELECOMMUNICATIONS MANAGER- Our on-line network has grown to well over 300 interactive terminals. We are looking for an experienced manager to lead a team of network designers and coordinators. RESPONSIBILITIES include design, installation and maintenance of a state-wide SNA network. QUALIFICATIONS include a Baccalaureate degree and five (5) years experience in telecommunications working with a large scale network.

ANALYST/PROGRAMMERS - We are seeking lead personnel with design experience to implement our Information Center and to complete our staff for a systems planning function . RESPONSIBILITIES include the appraisal of existing information resources, the selection of an information retrieval technology, the design of integrated systems and the planning of an office automation strategy. QUALIFICATIONS inlcude a Baccalaureate Degree and three (3) years of computing experience. Excellent communication skills are required.

COMPUTING ENVIRONMENT - We are currently operating an 8 meg IBM 3033 and a network of 300 interactive terminals. We are preparing for a late 1982 implementation of a multi-host distributed processing network.

PROCEDURE - We offer competitive salaries, commensurate with qualifications and experience. If you have demonstrated experience in these areas and want an opportunity to make a significant professional contribution, send your resume and salary history in confidence at the earliest possible date to:

Mr. Richard Macek
Department of Personnel
201 N. Indiana
Indiana University
Bloomington, Indiana 47405

An Equal Opportunity Employer

ROMAC®
FLORIDA

MEET THE CHALLENGE

Florida's tremendous growth has created unique opportunities in state of the art environments for motivated, dedicated data processing professionals.

PROGRAMMERS, ANALYSTS, SOFTWARE ENGINEERS, SYSTEMS PROGRAMMERS

UNLOCK YOUR POTENTIAL

215 E. Madison Street, Suite 809, Tampa, Florida 33602
(813) 228-6327

SAUDI ARABIA

Leading distributor of **Caterpillar, Ingersoll Rand, Volvo** and other prominent manufacturers seeks qualified candidates for **SPECIAL PROJECT TEAM** as well as **CAREER DATA PROCESSING POSITIONS:**

PROJECT TEAM

This specialized team will develop a multi-site Parts Order Entry and Inventory Control System.

PROJECT LEADER: Candidates will have had a minimum of five years relevant experience as Leader/Manager of a group responsible for on-line data-base systems design and implementation. This one-year assignment offers outstanding salary, incentive bonus, Company car, free housing, paid vacation with air-ticketing and other benefits. Acceptable candidate will be in single or married UNaccompanied status; Required on-site mid-July.

SYSTEMS ANALYSTS: Will design data-base, systems, programs, documentation, etc.. Requires a minimum of five years relevant experience. These one-year assignments offer outstanding salary, incentive bonus, Company car, free housing, paid vacation with airticketing, and other benefits. Acceptable candidates will be in single or married UNaccompanied status; Required on-site mid-July.

PROGRAMMERS: Candidates will have a minimum of three years experience with **COBOL** in data-base communications environment. These 9 month assignments offer outstanding salary, incentive bonus, free housing, paid vacation with airticketing and other benefits. Acceptable candidates will be in single or married UNacccompanied status; Required on-site prior to September 1, 1982.

Specialized accelerated training will be Company-provided for these Team Systems Analysts Programmers in NCR VRX-OLPD-TOTAL-TRAN-PRO.

CAREER OPENINGS

We also seek career-minded candidates for the following 2 year renewable contract openings within our organization:

SENIOR SYSTEMS ANALYSTS: With a minimum of 8 years relevant experience in Commerical Systems Development **'TOTAL'** Data-base design.

PROGRAMMER ANALYSTS: With a minimum of 3 years experience with System 34 multi-site installations preferably in Trucks and Vehicles distribution.

Our career positions offer attractive, competitive salary, free housing, Company Car, Paid vacation with airticketing, U.S. Tax advantages, and other benefits.

All positions will be resident in Jeddah, Saudi Arabia.

Interested candidates should mail **current** resume including **SALARY HISTORY** to:

Mr. A. C. Johnson
CW-A3254
Computerworld
Box 880
Framingham, MA 01701

U.S. Interviews will be held in June.
Telephone contact June 17-23 (212)586-7000

"Ætna works for me."

"A good systems programmer never stops learning. That's why I work at a place that never stops teaching. Ætna.

"Ætna's training program keeps me on top of my craft. Now this isn't a computer crash course. Only experienced and skilled computer professionals can take part. In fact, over 300 major corporations send *their* people to study with us.

"But Ætna's commitment to data processing doesn't stop there. The software and hardware is sophisticated and state-of-the-art. There are great benefits, including Life, Medical, Dental, and Disability Insurance. And best of all, they pay me what I'm worth.

"Sure, *I* work for Ætna. But only because Ætna works for me."

If you have 1-5 years' experience, call or send your resume to Mary Scott, (203) 273-3790, Recruiting Office, Ætna Life & Casualty, 900 Asylum Avenue, Hartford, CT 06156. An equal opportunity/affirmative action employer.

Experienced Systems Programmers and Programmer/Analysts wanted now.

Ætna

MIS PROFESSIONALS

... In the accelerated, dynamic growth setting of ATARI on the SAN FRANCISCO PENINSULA. Visualize what your career could be within a company with an unparalleled success story in advanced consumer electronics. Investigate long-term growth opportunities which provide you the ideal career elements for further success with full latitude to apply fresh technical insights to an exciting Corporate MIS environment undergoing rapid expansion, refinement & enhancement.

MIS EVENING INTERVIEWS

Tuesday & Wednesday, June 22 & 23 4-8 p.m.
Sheraton Sunnyvale Inn, 1100 No. Mathilda Ave.

Meet directly with ATARI's MIS Management Team to discuss these immediate needs in our vital MIS growth.

SR. PROGRAMMER/ANALYSTS

In this fast-paced applications group, you'll be challenged to new heights of technical excellence. Key growth opportunities for programming professionals with at least 3-5 yrs. experience on IBM hardware (360, 370, 3033, 4341, 3081) using COBOL to be involved in Manufacturing, Finance or Marketing/Order Processing applications. Strong communications skills are a must with degrees preferred.

BUSINESS ANALYST/MIS SUPERVISOR

As a member of a Marketing/MIS support team, provide first-line of communication with users, help define user system needs, organize and participate in training and generate user documentation. In-depth knowledge of marketing systems, strong communications skills and 6+ yrs. experience in a Marketing/MIS environment required. BS/BA preferred; MBA would be an asset.

SR. BUSINESS SYSTEMS ANALYSTS

Support division business systems requirements with responsibility for providing first-line communication between division manufacturing users and MIS. Participate actively in definition of user systems needs, recommending solutions to user problems as well as write business systems functional specifications & user manuals, reviewing & planning all systems modifications for the manufacturing divisions. Strong interpersonal and communications skills which include technical (but user-oriented) written skills essential. 5-8 yrs. significant experience in complex manufacturing systems & operations environments with BS or equiv. required. Opportunities also exist for intermediate-level analysts with 3-5 yrs. experience.

MIS OPERATIONS ANALYSTS

All Shifts

Be involved in review of JCL, monitoring production jobs and work on change control development, coming up with efficiency usage improvements. 3+ yrs. experience in a medium-to-large IBM shop including at least 1 yr. experience as either operations analyst or production support analyst. Background must include MVS, JCL & Utilities.

FOCUS SPECIALIST

Take advantage of this opportunity to utilize your specific experience with the software package FOCUS in our new Office Automation Group of ATARI. You will be responsible for all user training and support in the use of FOCUS and will be working independently on this and other related projects. Some knowledge of EXPRESS would be helpful. Min. 2 yrs. related experience required and BA/BS or equiv. would be ideal.

INFORMATION SYSTEMS MANAGER/INTERNATIONAL

Rare management opportunity for an aggressive, self-motivated professional to be actively involved in the installation of data processing support at manufacturing and sales facilities in the Far East and Europe. You will set the management direction and provide overall technical support to MIS group at each location. In-depth experience with IBM System 38 and MAPICS is essential, preferably in a multinational manufacturing setting. Degree in Business or Engineering or related technical discipline coupled with MBA and 2-3 yrs. project management level experience would be ideal. International travel approx. 50%.

INFORMATION SYSTEMS ANALYSTS/INTERNATIONAL

Key opportunities for skilled, experienced analysts to support installation of manufacturing and sales systems at overseas locations. Experience with these systems and installation techniques is essential. Specific knowledge of the IBM System 38 is highly desirable. Projects will involve installation of MAPICS at manufacturing sites as well as design and development of customized sales systems. Degree in Business or Engineering or related technical discipline coupled with MBA would be ideal. International travel approx. 50%.

ATARI's ENVIRONMENT:

IBM 3081, 4341; currently converting from DOS to OS/MVS. Data Base: COBOL, TOTAL, CICS.

Consider these significant career challenges now.

* If you live in the area, please join us on one of these evenings, no appointments are necessary. DIRECTION: Take 101 and/or 237 to Alviso or Mathilda exits, the Sheraton is located at the corner of Mathilda & Moffett Park Dr., in the Moffett Industrial Park in Sunnyvale.

* If interviews are not convenient, please send resume with salary history to ATARI, INC., Professional Employment MS/JB, P.O. Box 427, 1349 Moffett Park Dr., Sunnyvale, CA 94086. Equal opportunity employer m/f/h.

ATARI®
A Warner Communications Company

The advantages of a big city. The personality of a small one. Baltimore.

A data processing position at Equitable Bank will put you in the heart of one of America's most dynamic and revitalized cities. You'll be close to Baltimore's famed Inner Harbor, the National Aquarium and Harborplace. But, more than that, you'll be close to people who are truly proud of their city. People who have worked hard to make it a showplace and who look forward to the future with great enthusiasm.

Equitable, an area leader in the innovative use of computer technology, is seeking experienced data processing professionals. Our working environment includes an IBM 3033, 370/158 AP, Series-1, MVS, IMS DB/DC, Telephone Banking, On-Line ATM's and Automated Teller Network.

If you're interested in the job and the city, please send your resume to John Bliss, Equitable Bank, 11 E. 20th Street, Baltimore, Maryland 21218. An equal opportunity employer.

Equitable
Banking Groups

Applications Programmer

The right connections will take you far... They're doing it for AUGAT.

Augat has come a long way in the short 30 years that we have been producing electronic interconnection products. Today, we are known as the industry trailblazer.

Our Systems Division manufactures interconnect hardware and provides automated wiring services to the electronics industry. We are looking for a Data Processing Professional with working knowledge of Univac's Fortran V and an ASCII Fortran.

Responsibilities will include:

- Converting Fortran V to ASCII Fortran.
- Creation of new programs to interface and drive new and existing equipment.
- Interfacing NC machines to CAD system where applicable.
- Enhancing and expanding existing programs.

We utilize various NC machines including Excelon drills and Gardner Denver wirewrap machines. All programs are run on Univac 1100/20 and 1100/60 computers. We require suitable experience to meet the technical responsibilities described above.

If you meet the above qualifications and want to make the right "connections", please send resume and salary requirements in confidence to:

Division Personnel,
Augat, 33 Perry Avenue,
Attleboro, Massachusetts 02703.

AUGAT®

Equal Opportunity Employer M/F

MVS SYSTEMS PROGRAMMER

This is your opportunity: Take on maximum professional responsibility; work on highly visible projects; and do it all in a state-of-the-art environment. (IBM 3081, 3033, MVS, IMS, CICS.)

We are working to keep ahead of the DP and telecommunications needs of Transamerica Corporation affiliates. We will involve you in:

- Migration from SP1 to SP3
- Heavy problem-solving through dump-analysis of MVS and JES2
- Writing SMF and JES2 exits, performing MVS and I/O gens, and handling other systems programming duties.

This challenging position requires knowledge of MVS and JES2 internals plus a working knowledge of Assembler, TSO, SMP4, IBM utilities and OS/JCL — along with the desire to work on the DP challenges of the '80s and '90s.

Please mail your resume or call: Transamerica Information Services, 1149 So. Broadway (B-610), Los Angeles, CA 90015, Attn: D.L. Campbell. (213) 742-4535.

Equal Opportunity Employer MFHV

Transamerica
Information Services

Systems Programmer

Johnson & Johnson, a world-wide leader in the health care industry is seeking a Systems Programmer to support its corporate DECsystem-10 Timesharing System. The successful candidate should possess a degree in computer science or mathematics. A Masters Degree is preferred. The individual should have 3 years working experience on the TOPS-10 or TOPS-20 operating system plus knowledge of MACRO-10, ASSEMBLY, and FORTRAN languages.

Additional responsibilities include:

- the installation, maintenance, and documentation of system software
- education of system users in the application of this software
- monitoring system performance and capacity, and system fine tuning.

Interested candidates are requested to send detailed resume including salary history in confidence to: Lorraine C. Kirczow, Johnson & Johnson, Management Information Center, Route 202, Raritan, N.J. 08869

Johnson & Johnson
Leadership Beyond Compliance
An equal opportunity employer M/F

POSITION AVAILABLE

One (1) position (Instructor or Assistant Professor), tenure track, to begin September 1, 1982.

The specific requirements of this position are:

1. Candidate must have at least a M.S. in Computer Science or;
2. Candidate must have a M.S. in Management Information Systems.

Salary: $18,000 to $22,000 dependent on qualifications.

Location: River Falls is located 30 miles south-east of Minneapolis/St. Paul.

In order to be considered for this position, please send resume to:

Lyle D. Oleson, Chairman
Search and Screen Committee
Department of
Mathematics/Computer Systems
University of Wisconsin-River Falls
River Falls, WI 54022

Deadline to apply is July 15, 1982.

UW-RIVER FALLS IS AN EQUAL OPPORTUNITY EMPLOYER AND ACTIVELY SEEKS APPLICATIONS FROM ALL QUALIFIED PERSONS REGARDLESS OF RACE, COLOR, CREED, SEX AGE OR NATIONAL ORIGIN.

WANTED
Director, Retail Sales- Very Small Business Computer Operations

Basic Four Business Products Corporation, a subsidiary of a New York Stock Exchange listed high technology firm is seeking a director level position to form a retail marketing distribution organization for a newly announced family of microprocessor based small business computer products. This position is based in Albuquerque, New Mexico, a city offering many unique living advantages including lower cost of living, pleasant climate and numerous outdoor actitivites.

Position requires development and implementation of a success plan and strategy to sell very small business computers to first time users in a retail environment, selection of support personnel to form a marketing distribution organization and director of the organization in the vigorous execution of the business plan.

Position offers excellent compensation and benefit package. Interviews will be arranged during the COMDEX show in Atlantic City from June 28th to 30th or in Albuquerque on an individual basis. To set up your personal appointment, contact **Maggie Quillin at (505) 298-5811.**

SOUTHERN EXPOSURE FOR DATA PERSONNEL

We've uncovered opportunities for 13 years. Let us tell you of positions that offer greater responsibility, a salary increase or a more desirable location. OUR CLIENT COMPANIES INCLUDE 63% of the Fortune 500 industries plus many small specialized firms coast to coast. Call or send confidential resume. No contract to sign. All positions fee paid by client companies

PHONE TOLL FREE
1-800-334-4220
NC (919) 484-4104

Nationwide Personnel Services, Inc.
P.O. Box 35925
Fayetteville, N.C. 28303

EDPeople

Byte into these technical opportunities!

TECH SERVICES SUPV:
DOS/VSE, sysgens, CICS, ALC, 2-5 yrs. exp. $24-29K

MVS SYSTEMS PROG:
Super S.O.A. shop - 303x IMS DB/DC, TSO $35-42K

DOS CONVERSION:
Honeywell shop to 4331, exc. growth slot! $28-32K

FEE PAID (513) 224-0600

SUSAN ROBINSON - JIM LEE

ROBERT HALF OF DAYTON, INC.
First National Plaza
Dayton, Ohio 45402
Lic. DAPC Member

HONEYWELL LEVEL 6 DPS 6
PROGRAMMERS/ANALYSTS
PROJECT LEADERS

Send resume and salary history to:

CD SYSTEMS INC.
14614 Grover St., Ste.200
Omaha, NE 68144

We Specialize In

DATA/VOICE COMMUNICATIONS

$25K to $45K

We have many outstanding opportunities throughout the nation.

Voice/Data Networking
Hardware/Software

Fortune
Personnel Consultants
154 Broad St. Dept. C
Nashua, N.H. 03063
(603) 880-8880

NCR CIF

A progressive $145 million Central Ohio bank offers a challenging opportunity for a self motivated Programmer/Analyst. Candidates should have a minimum of 2 years experience with NCR B or C Series CIF. Project leader and COBOL experience helpful. Sumbit resume and salary requirments to:

Reply to CW-A3270
Computerworld
Box 880
Framingham, MA 01701
An Equal Opportunity Employer

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 709 FRAMINGHAM, MA 01701

postage will be paid by

CIRCULATION DEPARTMENT
COMPUTERWORLD

375 Cochituate Road, Rte. 30
Box 897
Framingham, MA 01701-9985

Fold and insert order form (attached through binding) and remittance here.

position announcements | position announcements | position announcements | position announcements | position announcements

SENIOR DIRECTOR MANUFACTURING AND ENGINEERING SYSTEMS

State of the art IBM client needs extremely high caliber individual. High visibility with excellent upward potential. Requires degree, with a minimum of three years management experience and strong knowledge of manufacturing systems. Excellent salary, bonus and benefit package. Midwest location. Immediate consideration.

MANAGER MANUFACTURING SYSTEMS

Progressive manufacturing firm offers a move into management. Looking for a sharp individual that is currently project leader or equivalent. Requires degree plus hands-on development experience using DBMS-10 or IDMS. Salary 35-40K plus benefits and good promotion potential. Midwest location.

FEE PAID.
ALL INQUIRES
STRICTLY CONFIDENTIAL.

EFFECTIVE SEARCH INC.
2819 E. Central, Suite C
Wichita, Kansas 67214

DALLAS

DATA BASE ANALYST

Position with a major petroleum co. Will be a part of a team developing IMS Data Bases. Requires 6 yrs. DP exp. and 2 yrs. in design & development of IMS Data Bases.
TO: $37,000

SYSTEMS SUPERVISOR

Will have key responsibility planning and organizing development of major applications. B.S. Comp. Sci. and/or MBA req'd. Supervisory and petroleum industry exp. mandatory.
TO: $37,000

CONTACT: John Staiger

ROBERT HALF
OF DALLAS, INC (214)363-3300
Two NorthPark East Suite #750
Dallas, Texas 75231

The Department of Urology at the Baylor College of Medicine seeks a "self-starter" to manage and program a multi-user Cromemco System II running Cromix. Experience with the Cromix or Unix operating systems is a big plus.

Please send resume to:

Department of Urology
Baylor College of Medicine
Houston, Texas 77030

Creativity (cre-a-tiv-i-ty)

1. A human resource of superlative programmers and designers. 2. The key ingredient of IDMS, the first dictionary-driven database management system.

At **Cullinane**, creativity is the wellspring for famous firsts. We were the first company to specialize in computer software products. We were the first computer software products company to be listed on the New York Stock Exchange. And now, **Cullinane** is again the first to introduce three levels of integrated software: database, applications and graphics. With an integrated database management system as a foundation, companies will realize increased efficiency – throughout all levels of their organization.

We'll level with you. Innovative approaches and creativity aren't just history at **Cullinane.** We're the nation's most financially successful software company, and we stay that way by providing an environment for software professionals that encourages new ideas and supports creativity.

If you want to bring your creativity to this kind of company, look up **Cullinane.**

Systems Software Development

Requires creative highly motivated professionals with extensive background in systems programming or control systems software development. Results-oriented customer responsive environment. Development openings are within the following groups:

- **Database**
- **Data Communications**
- **Integrated Data Dictionary**
- **On-Line Query**
- **Audit-Retrieval**
- **Application Development System**

Applications Software Development

Requires senior level (minimum 3-5 years) experience in design, development and implementation of financial (general ledger, A/P, A/R, etc.) or manufacturing applications. Database background essential. Project leadership experience desirable. Good communication skills and ability to work independently.

Qualified candidates should submit resumes, in confidence, to Roy Evarts, Employment Manager, **Cullinane Database Systems, Inc.**, 400 Blue Hill Drive, Westwood, MA 02090.

An Equal Opportunity Employer

Database Systems
Cullinane

We have a challenging opportunity for a systems analyst desiring to work in a state-of-the-art environment:

-Virtual operating system
-On-line and batch system
-On-line software
  -TP-Monitor
  -Screen generator
  -Query/Report Writer
-Structured methods
-Data base

The following is required for this position:

-BS or BA degree
-Two years programming
-Three years in systems analysis designing business systems using formal procedures and documents
-Experience with on-line or data base preferred

If you qualify and are interested in this position, please send your resume to our Personnel Department.

ALGONQUIN GAS TRANSMISSION COMPANY
1284 Soldiers Field Road, Boston, MA 02135
(617) 254-4050
An Equal Opportunity Employer

BOULDER COLORADO

Manager of Computer Maintenance
($29,220 - $43,836/yearly)
Computer Service Engineer II
($22,380 - $33,564/yearly)

The National Center for Atmospheric Research (NCAR) has an opening for a manager responsible for a small group of in-house computer maintenance engineers with responsibility for contracted maintenance also. This position requires high level management skills and a diversified knowledge of computer systems capabilities.

Another opening exists within this group for a computer service engineer to perform maintenance and repair work on sophisticated computer systems, sub-systems and peripheral devices.

To apply, call Margareta Domecki, (303) 494-5151 ext. 517 or 666 or send resume to:

NCAR
Employment Office
P.O. Box 3000
Boulder, CO. 80307
An Equal Opportunity/Affirmative Action Employer

Data Communications Software Development

If you are currently involved in any of the following:

SOFTWARE DEVELOPMENT and DESIGN of MICROPROCESSOR SYSTEMS, COMMUNICATIONS PROTOCOLS, INTELLIGENT TERMINALS, QUEUEING, NETWORKING and DIAGNOSTICS then RACAL-MILGO has a challenge for you.

We at Racal-Milgo are rapidly expanding our present product line to meet evolving business communications needs. Our engineers are designing comprehensive systems that have the flexibility to accommodate future growth by providing a broad range of new and exciting capabilities to transport information.

Racal-Milgo offers excellent salaries, complete company benefits including 100% paid tuition, life/medical/dental insurance, a liberal relocation policy which includes MORTGAGE INTEREST DIFFERENTIAL and one of the most pleasant working environments in South Florida. Please send your resume to Marietta Watson or call 305/748-3507 (collect) for further information.

Racal-Milgo® RACAL

Racal-Milgo, Inc.
7800 W. Oakland Park Blvd.
Sunrise, Florida 33321

EQUAL OPPORTUNITY EMPLOYER

Arizona/California/Texas/Colorado/Florida
SCIENTIFIC OR BUSINESS PROGRAMMERS

All fees and relocation paid. $20-40,000

If you have a BSEE, BSCS, BS in Mathematics or Physics or equivalent, we need you right now.
For Business: OS/DOS/IMS/CICS/MVS/JES Prog/Anal/Systems/Data Base. All large scale installations.
For Scientific: experience in the computer, communications, semiconductor, or aerospace/defense industries.
Your name, resume, and present employer will not be given out without your permission.
For sincere personal service, please send a confidential resume to:
Dan Pullman (602) 274-5860
PULLMAN PERSONNEL
3033 North Central Ave. Suite 401, Phoenix, Arizona 85012

NEW START-UP OPPORTUNITIES

Having a difficult time deciding where to send your resume? Fox-Morris specializes in the placement of all programmers & systems analysts. We work primarily with TOP FORTUNE 500 Companies throughout the S.E. with special emphasis on new START-UP opportunities. For a clear understanding of our clients' needs write or call Robert Montgomery at 919/872-2940. All fee paid positions. No obligations

FOX-MORRIS
Personnel Consultants
Since 1962
3101 Poplarwood Court
Raleigh, NC 27625

position announcements | position announcements | position announcements | position announcements | position announcements

Programmer/ Analysts:

Investigate PMI's Success

Precision Monolithics Inc. is a leader in high performance linear, telecommunications, data acquisition and conversion integrated circuits. We thrive on continued challenges, customer demand, rapid sales growth and expansion into new product and technology areas. The following career opportunity is a result of our success and expansion. Investigate a move to PMI.

Programmer Analyst

As a programmer analyst, you will be responsible for designing, modifying and enhancing existing computer systems, to meet our continuing needs due to growth and expansion. Finally you will provide program and user documentation of new or existing system.

PMI has state-of-the-art on-line interactive computer systems and is seeking progressive employees to continue this development and success. The successful candidate will possess working experience with COBOL, on-line computer system and utilities. Experience or an interest in working with HP3000 database systems is desirable.

If this opportunity sounds like your chance to achieve career growth and challenge in an exciting company with career progression potential please send your resume to Sherrie Wilkins, Professional Employment. An equal opportunity employer.

Precision Monolithics Incorporated

PMI

1500 Space Park Drive
Santa Clara, CA 95050
408/727-6741

HONEYWELL SOFTWARE SPECIALIST

Los Angeles Area

As the nation's leading distributor of electronic components, **Hamilton Avnet** offers you the security, growth and outstanding benefits you're looking for at our corporate headquarters.

- **GCOS Analyst** (GCOS 3)
- **Communications Analyst** (NPS, GRTS-II)
- **Data Communications Specialist** (Troubleshoot TELCO, Hardware, MODEM malfunctions on nation's largest Honeywell online system)
- **Tandem Software Analyst** (TAL, GUARDIAN, SYSGEN, PATHWAY)

For immediate professional consideration, please call COLLECT or send resume to:

Brett Holleman
Employment Manager
(213) 558-2673
10950 W. Washington Blvd.
Culver City, CA 90230

Equal Opportunity Employer

Hamilton Avnet ELECTRONICS

SR. SYSTEMS PROJECT LEADER

$32,352 - $39,072 Annually

The Office of the Chancellor of the California State University has an opening with the Administrative Systems Group located on the California State University, Fresno campus.

This position will be responsible for the development of administrative applications software that will be used throughout the 19 campuses of the CSU. These systems utilize state-of-the-art online techniques.

This is an opportunity to provide a leadership role to a central systems development team, working with one of the newest and most powerful data processing networks in the United States.

Applicants should have experience in analysis and programming of large business, student or administrative systems. Project leadership experience, good management skills and ANSI COBOL experience are required. Online experience is desired.

Equivalent to graduation from a four-year college is required. Experience can be substituted for up to two years of the required education on a year to year basis. Final filing date: July 2, 1982, 5:00 p.m. Please call (209)294-3923 or send resume to:

James Morris, Manager
Division of Information Systems
California State University, Fresno
Fresno, CA 93740

An Equal Opportunity/Affirmative Action Employer

University of Maryland
University College
Director, Office of Computing Services

The Director is responsible for the administration of the University College Office of Computing Services which supports the administrative and instructional computing of the College. The Director provides leadership for planning and budgeting in Computing Services and supervises both the operation of the Computing Center and the development of software applications.

University College is in an online, distributed administrative environment utilizing an HP 3000 Series III. Academic and research computing is supported by an IBM 4341 with a microcomputer laboratory under construction.

Candidates must have a minumum of five years experience in higher education computing. Their relevant professional background must reflect increasing responsibility as well as expert knowledge of hardware procurement and software development using DBMS, capacity planning and performance analysis. Hardware experience should include work with HP and IBM. Master's Degree desirable.

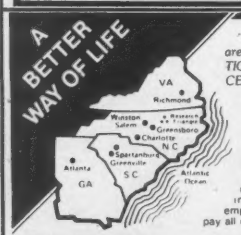
University of Maryland University College, with offices at College Park, is the continuing education campus of the University. It provides undergraduate and graduate programs in credit as well as non-credit instruction within the state and overseas.

Position available August 1, 1982. For full consideration applicants should submit a complete resume, and names and addresses of three current references by July 15, 1982 to:

Search Committee, Director, Office of Computing Services, Office of the Chancellor, University of Maryland University College, University Blvd. at Adelphi Rd., College Park, MD 20742

An Equal Opportunity/Affirmative Action Employer

A BETTER WAY OF LIFE



OUR CLIENTS

are the leading NATIONAL and INTERNATIONAL corporations with major DATA PROCESSING CENTERS in NC, SC, So. VA, No. GA. They offer "state of the art" TECHNOLOGY, excellent WORKING CONDITIONS, outstanding FRINGE BENEFITS and nationally COMPETITIVE SALARIES.

WE ARE PROFESSIONAL RECRUITERS

We are paid by our company clients to assist them in identifying the talent required for their continuing growth. Your presentation to a potential employer is personal and confidential. Our clients pay all interview and relocation expenses.

TELECOMMUNICATIONS ANAL TO $39K
Min 6 yrs D.P. experience with 4 yrs Network Software Support, SNA-VTAM-NCP, under OS/MVS.

SR TECH ANALYST TO $36K
Min 5 yrs expenence with PDP-11, RSX-11 M or M + Software Support, DECNET a plus.

COMMUNICATIONS SYS PROG TO $35K
Min 5 yrs exp with IBM SNA Software Products & Com 10 Communications Processors.

SYSTEMS ANALYST TO $34K
Min 6 yrs exp with 2-3 yrs detailed design &/or programming, Sales & Mkt systems development. IDMS, SAS, Data Base Sys background desirable.

BUSINESS SYSTEMS ANAL TO $32K
Min 4 yrs experience in the development of sales and marketing systems.

HIGH QUALITY ASSURANCE TO $31K
Min 8 yrs exp with 3 yrs project mgt exp. Structured prog & design in regulated industry.

SOFTWARE SUPPORT ANAL TO $31K
Min 3 yrs experience in the installation & maintenance of CICS.

BUSINESS SYSTEMS ANAL TO $29K
Min 7 yrs exp w/3 as supervisor, Financial Applications development experience.

COMPUTER ANALYST TO $28K
Min 2 yrs COBOL, OS-JCL, Data Base Design. IDMS or IMS & CICS are a plus.

ANALYST/PROGRAMMERS TO $28K
Min 3 yrs COBOL, OS-JCL, manufacturing applications, CICS a plus.

PROGRAMMERS TO $27K
Min 2 yrs COBOL with OS-JCL, IMS &/or CICS experience a plus.

WE PRACTICE AFFIRMATIVE ACTION

Call TOLL FREE 1-800-334-0815 (in NC call 1-919-378-9894) or write (please include current resume; salary history; career, salary & geographic objectives.) U.S. Citizens or Permanent Residents only.

STO FOX personnel consultants P.O. BOX 6788 • GREENSBORO, N.C. 27405

RESOURCE SCIENCES ARABIA LTD.

WE'VE GOT THE PROFESSIONAL AND TAX ADVANTAGES YOU'RE LOOKING FOR. RSAL, the Saudi Arabian affiliate of Holmes & Narver, Inc., is seeking personnel for ARAMCO projects. These are 12-month, single status contracts which offer superior compensation, liberal vacation and free food and lodging. Each position requires that you be eligible for a U.S. passport.

Systems Programmer Analysts

BSCS or technical degree and 7+ years experience with IBM 370 or 303X mainframe and PL1 experience with TSO/SPF, IMS (DBDC) and Mark IV ADF for business applications required.

Systems Analysts

BSCS or technical degree and 10+ years on IBM 370/158 with 3033 and heavy scientific/simulation background (FORTRAN, ASSEMBLY, PASCAL) for geologic and seismic applications and interpretations. Experience with major oil company exploration operation a decided advantage.

Send resume to the office nearest you only.

E. K. Houser, Dept. CW82-2
999 Town & Country Rd.
Orange, CA 92668

Bill Hedlund, Dept. CW82-2
50 Briar Hollow Ln., Ste. 400W
Houston, TX 77027

Will Gordon, Dept. CW82-2
2 W. Potomac Pkwy.
Williamsport, MD 21795

HOLMES & NARVER, INC.
ENGINEERS-CONSTRUCTORS

Equal opportunity employer

SOFTWARE SYSTEMS COORDINATOR

San Diego City Schools
$31080 to $37,776 annually
* Career Position
* Excellent Benefit Package includes 4 week paid annual vacation

San Diego City Schools has a management team vacancy for the person with progressively responsible experience in the generation and maintenance of OS/VS1 or MVS operating systems. Experience in VM/SP, VSAM, DATA BASE, and CICS/VS is desirable.

Submit detailed resume immediately to: San Diego City Schools, 4100 Normal Street, San Diego, CA 92103. (714) 293-8152.

Qualified candidates will be contacted at once to schedule interviews.

AN EQUAL OPPORTUNITY EMPLOYER

SUNBELT

Prog, Prog/A, System Analyst	
VTAM	$38K
BANKING	$35K
COBOL OR PL1 OR NEAT 3	$29K
INSURANCE	$30K
RPG III	$30K
FORTRAN	$31K
MINI BACKGROUND	$25K
MAPICS	$28K

ROBERT HALF OF LOUISIANA, INC
4630 One Shell Square
New Orleans, La. 70139
(504) 524-3773

DP SYSTEMS & PROGRAMMING SUPERVISOR

City of Flint, MI

Enjoy the challenge of state-of-the-art atmosphere that includes database on-line programming and user friendly on-line systems, all supported by a dyadic processor. Oportunity to be involved in implementing word processing and distributed processing to aid our users.

The Flint area offers excellent year round recreational activities and is nationally known for its' college and cultural center. Its Mott program of community education and recreation are internationally known.

Position offers starting salary up to $30,253 with extremely competitive fringe benefit package. For details, send resume immediately to:

Mrs. Randy Fierke
City of Flint Personnel
1101 S. Saginaw
Flint, MI 48502.

MANAGER - TECHNICAL SUPPORT

Corporate client operating one of the countries most sophisticated computer installations, requires an experienced technicial support manager. This leadership position is highly visible in the MIS management team.

A strong background in a large, multiple mainframe, IBM environment is required, including previous personal experience with OS/MVS, CICS, IMS and multi-functional data communications network. The candidate selected will establish and manage a department responsible for systems programming, standards, computer performance evaluation and hardware capacity planning. Only managerial candidates with proven supervisory skills and the ability to communciate effectively in both technical and nontechnical terms should apply.

Position is located outside a major east coast metropolitan area and offers an outstanding compensation and benefits package. Send qualifications and salary history in confidence to:

Reply to CW-A3272
Computerworld
Box 880
Framingham, MA 01701

DATA PROCESSING MANAGER

Southeastern multi-magazine publisher has need of experienced manager with strong technical background; ability to communicate with users and to direct staff of programmers and data entry department. COBOL a must. Experience with on-line equipment or NCR equipment helpful. Excellent career opportunity for right person. Salary commensurate with ability. Send resume and salary requirement to:

CW-A3267
Computerworld
Box 880
Framingham, MA 01701

SYSTEMS ANALYSTS AND PROGRAMMERS FOR SUNBELT LOCATIONS

Job dissatisfaction, complacency, and frustration are the biggest obstacles to overcome to achieve one's career goals. Every day new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call or write Keith Reichle, CPC, Data Processing Specialist.

Dunhill
Of CHARLOTTE, INC.
6401 Carmel Road, Suite 107
Charlotte, North Carolina 28211
800-438-2012
(INC Call)
(704) 542-0312

DATA PROCESSING PROFESSIONALS

OPEN HOUSE

Come Visit Our New Office on Tuesday, June 15th, Between 5PM-8PM

AUXCO

We are pleased to invite career minded Professionals to meet with us at our new Parsippany office to discuss the diverse opportunities available with our organization.

Our consistent commitment to quality products and services has earned AUXCO a reputation for leadership and excellence unparralleled in our field. We in turn are interested in people with high standards looking to contribute their talents to our rapidly expanding organization.

The individuals we seek should have a minimum of four (4) years IBM experience and be thoroughly knowledgeable in COBOL, PL/1, or Assembler. IMS or CICS is a plus, as is communications industry or related experience. Positions are available in Orlando, Fla. and throughout the N. Y./N.J. metropolitan areas.

In addition to providing a challenging State-of-the-Art environment, AUXCO also provides exceptional career development, on-going formal training and a superior benefits package.

Don't leave your career to chance. If you are success oriented, and looking for a company that will offer you the opportunity to excel, we welcome you to stop by on TUESDAY, JUNE 15th, between the hours of 5 PM and 8 PM. Should you be unable to attend, we invite you to call or send a resume to:

SUSAN ABRAHAM

AUXCO

AUXTON COMPUTER ENTERPRISES, Inc.
6 Century Drive, Parsippany, New Jersey 07054
(201) 285-9636
AUXCO is an equal opportunity employer

There are no real boundaries at our Research and Development Division.

— which is just as it should be.

A true environment of inquiry is rare in any large corporation busily growing across a broad spectrum of government, military, and commercial programs involving computer-based systems of every description.

In the R&D division of PRC, just such an environment has been created, so that inter-disciplinary specialists from widely diverse subject areas can join forces to transcend the boundaries of technology... and the mind.

These are two important opportunities to investigate now:

KNOWLEDGE ENGINEER

You will be a key contributor to an artificial intelligence project just getting underway. You must be familiar with the state of the art in Expert Systems development, and Knowledge Representation Language in specific. Graduate level training in Artificial Intelligence, or industrial AI experience and an advanced degree in Computer Science, Math, or Engineering are among the qualifications we would expect you to have.

COMPUTER GRAPHICS SPECIALIST

This is a lead position, an especially promising opportunity for an individual with as little as 2-4 years experience in computer graphics, as long as it includes color graphics, animation graphics, and interactive programs. Some knowledge of the C³I environment and familiarity with database management systems would be helpful.

Upon arrival here you will begin immediately to survey the present state of the art, and structure a new development program to build a superior graphics capability at PRC.

For immediate consideration, please forward your resume or telephone Jeanne Spoor at (703) 556-2224.

prc

Planning Research Corporation
1500 Planning Research Drive, McLean, Virginia 22102

An Equal Opportunity Employer

Systems Analyst - Programmer

EXCELLENT OPPORTUNITY as Computer Department manager. Position in analysis, design, and implementation of engineering and management applications for consulting civil engineering firm, including project control, accounting and personnel data retrieval. Includes feasibility studies, hardware and software evaluation, systems analysis and design and programming.

Bachelor's Degree in Math, Engineering, or one of the sciences; 3-5 years' programming experience in business systems; knowledge of FORTRAN, COBOL, and HP 3000. Must have knowledge of accounting concepts and experience with data base management systems; should have good human relations and leadership ability, and ability to communicate effectively with all levels of management; should have good analytical and communicative skills.

Please send resume to Personnel Department.

Fay, Spofford & Thorndike, Inc.
One Beacon Street, Boston, MA 02108
(617) 523-8300

Applicants will be considered on the same basis without regard to race, color, religion, sex, age, or national origin.
An equal opportunity employer M/F

FLORIDA

availABILITY, Inc.

All Expenses Paid

Our clients, in urgent need of your expertise will pay all your expenses in relocating you to an area of Sun & Fun, No State Tax.

Average Temperature 75°.

PROGRAMMER ANALYSTS
SYSTEMS ANALYSTS
SYSTEMS PROGRAMMERS
DATA BASE ANALYSTS

AVAILABILITY, INC.
813/872-2631
Dept. C, P.O. Box 25434
Tampa, Florida 33622

SENIOR LEVEL MIS OPPORTUNITIES

An East Coast based Fortune 500 company in a suburban area seeks two senior level candidates for the following positions:

MIS PLANNING ADMINISTRATOR - Reports to the Senior Data Processing Executive and will play a key role in establishing departmental goals and objectives. Previous experience as a Senior Systems Analyst and excellent communication skills will insure that departmental activities effectively support the needs of our rapidly growing company.

SENIOR PROJECT MANAGER - Reports to the Manager of Systems Development and will be responsible for insuring key projects of varying complexity are completed on time and within budget.

GENERAL QUALIFICATIONS: Successful candidates will be strong commmunicators, and will be able to interface effectivley with all levels of management. They will possess strong leadership and supervisory skills, appropriate Bachelor's Degree and be able to handle greater levels of responsiblity.

For confidential consideration please send resume, salary history and a brief statement of your personal and professional goals to:

Reply to CW-A3269
Computerworld
Box 880
Framingham, MA 01701

EEO M/F

VAX/VMS

You will be responsible for the support and enhancement of the VAX/VMS interface to the Britton-Lee intelligent database machine. Candidate should have at least one year experience with the VAX/VMS operating system. C experience required. A B.S./M.S. in computer science or equivalent experience required. Send resume to the attention of: Dr. Robert Epstein, Vice President or Eric Allman, Director.

BRITTON-LEE, INC.
1919 Addison St.
Berkeley, CA 94704
(415)548-3211

PROGRAMMER

SYSTEM 34

ALL DEVELOPMENT HEAVY SYSTEMS DESIGN

Prestigious, commercial real est. firm has an outstanding Senior level position aval. The qualified candidate must have 3-4 yrs. System 34, RPG II exp. with a strong systems analysis bkgd. Respon. incl. incorporating the System 34 into all areas, heavy analysis & user interface with top mgmt. Join this progressive, highly motivated & success-oriented org. Super benefit package. $36,000 FEE PAID.

ROBERT HALF OF NEW YORK, INC.
522 Fifth Avenue
New York, N.Y. 10036
212-221-6500 (agency)

FACULTY POSITION IN COMPUTER EDUCATION

A Northwest Community College, east of Portland, needs a person to teach courses in the languages of BASIC, FORTRAN, COBOL, PASCAL, Report Program Generator, ASSEMBLY; Introduction to Computers and Introduction to Time Shared Processing. Required: Master's degree in computer science or management information systems, or mathematics with emphasis on computers, or equivalent. Desirable: Operational knowledge of BASIC, PASCAL, COBOL, ASSEMBLY, FORTRAN, RPG II, MPE IV; Computers: HP3000, TRS 80, Apple, Atari. Successful teaching experience at the college level in computer education. Tenure-track position for the regualr academic year, starting in September 1982. Summer teaching possible in 1983. Application deadline is July 5, 1982. For full details, write to: **Director of Personnel, Mt. Hood Community College, Room 2270, 26000 SE Stark Street, Gresham, OR 97030.**

AFFIRMATIVE ACTION/EQUAL OPPORTUNITY EMPLOYER

position announcements | position announcements | position announcements | position announcements | position announcements

MPG is shaping the future in software

Be an MPG SOFTWARE ENGINEER

Participate in the design, development, and management of MPG's future generation of software.

MPG takes the most advanced software technology available, puts it to practical use, and supports it with high-caliber professionals. The result is five successive years of growth in excess of 50% per annum.

MPG is a leading producer of generalized systems software for the IBM marketplace, with:

- RAMIS II, the first product to integrate a user-oriented, English-like nonprocedural language with a comprehensive DBMS
- The MPGSWIFT product line, an efficient, economical and easy-to-use TP monitor, data entry system, and online program development tool

Candidates must be highly creative and self-motivated with demonstrated experience in IBM assembler language programming, DBMS or teleprocessing, and software development. Specific experience in any of the following areas is also desirable:

- DOS/VSE/POWER internals
- VM/CMS internals
- OS/MVS internals
- VSAM • BTAM or VTAM
- Compiler Development

MPG offers an excellent working environment, including our own computers and private offices with terminals and flexible work day. We reward high achievement with excellent performance incentives. Salaries are very competitive and our benefit package is one of the best in the industry.

MPG is headquartered in Princeton, New Jersey. If you want what we offer and have the experience we need, send your resume in confidence to: Juanita Bodden, Mathematica Products Group, P.O. Box 2392, Princeton, New Jersey 08540.

Shape the future with

MPG **Mathematica Products Group**

Yours and ours

An Equal Opportunity Employer M/F/HC

CHIEF, BUREAU OF MANAGEMENT INFORMATION SYSTEMS CITY OF BALTIMORE

Large scale computer facility with two data centers. Heavy data communications and on-line applications. Multi-task operations. Data base applications. In-house systems and programming staff and multi-users. Oversees total City acquisition of equipment.

Position requires Bachelor's Degree and 3 years experience as Director/Manager, Assistant Director/Assistant Manager in large scale data processing operation, applications and software programming, and systems analysis. Two additional years of experience is required in any one of the areas.

Resume to: Deputy Director of Finance, Room 449 City Hall, Baltimore, Maryland 21202 no later than June 25, 1982.

Salary - upper 40's

Equal Opportunity Employer

DATAPOINT DP MANAGER HOUSTON

Where have all the qualified Datapoint ALC DP Managers gone? Our multi-processor ARC client company is in immediate need of a seasoned datapoint pro to take over the shop. You must have extensive Datapoint Assembler background and be familiar with distributed networks. For further information contact:

George Bostick
Lyman Personnel
3100 Timmons, Suite 300
Houston, TX 77027
(713) 627-1110

DALLAS

DEC SYSTEM ENGINEER

Outstanding co. with full interview, relo. pkg. needs strong DEC bkgrnd. for new development projects. Salary to high $30's. Degree required. Stable environment with backlog of work to guarantee long-term employment.

2730 Stemmons Frwy., 1109W
Dallas, TX 75207, (214) 637-6360

DATA PROCESSING CAREERS inc

PROGRAMMERS

Our client, a major South Florida Financial institution, currently has several openings in their EDP department for qualified programmers. Individuals must have a minimum of 2 years NCR experience; CLASS experience is also preferred.

Enjoy an aggressive state-of-the-art environment. Rewards are substantial and closely tied to performance. Call Crume and Associates for further information **(305) 443-2470** or send resume to: **Douglas Center, 2600 Douglas Road, Suite 604, Coral Gables, Florida 33134.**

Equal Opportunity Employer M/F

MAINE

We have specialized in data processing professional placement in Maine for almost a fifth of a century. If you qualify for positions in the $25-35,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC
477 Congress St.
Portland, Maine 04101
(207) 773-4749

PHILADELPHIA

SYSTEMS ANALYST TO 30K CENTRAL JERSEY

Leader in state-of-the-art tech reqs 3 yrs sys analysis exp w/COBOL pgmg bkgd for shirt sleeve spot. Biz apps. IBM OS/MVS. EXCEL RELO PKG & BENEFITS.

Contact: Regina Cosfol

ROBERT HALF OF PHILADELPHIA, INC.
2000 Market St., Suite 706
Philadelphia, PA 19103
(215) 568-4580

COMPUTERWORLD CLASSIFIEDS--

--PROGRAMMED TO HELP YOU.

The computer industry is dedicated to developing greater efficiency and valuable time-saving resources for the business world.

Well, so are ***Computerworld Classifieds.***

With 114,408 paid subscribers and a pass-along readership of 425,598, Computerworld can bring your advertisement to a potential audience of more than half a million readers. Along with that comes a greater chance of substantial reader response and a solution to your particular problem.

And we can deal with a lot of problems. Our classifications include:

Position Announcements -- To help you find the computer professionals right for you.

Positions Wanted -- For individuals seeking full-time, permanent positions-no company ads are allowed.

Buy, Sell, Swap -- For those seeking to buy, sell or lease computer equipment.

Time & Services -- For companies who want to offer computer timesharing or other computer-related services.

Software for Sale & Software Wanted -- Used for buying & selling software packages.

Business Opportunities -- For those seeking individuals or partners in computer-related business ventures, mergers, or franchises.

Real Estate -- For those seeking to sell or lease office space suitable for computer rooms or computerized businesses.

Bids & Proposals -- Used to request for bids on equipment or to invite proposals for desired computer acquisitions.

The Computerworld Bulletin Board -- Our newest addition to the classified pages of Computerworld, this is a low-cost way to buy or sell individual pieces of hardware or software. See below for details on sizes and cost.

Here's the data you need to know to place your ad:

The deadline for classified advertising is ten days prior to the issue desired. (That's six working days prior to the issue date). Ads may be sent in by mail. For camera-ready ads, a velox or negative is required. For ads to be typeset by us, enclose a layout if needed, along with any logos or artwork you would like to include in the ad. These must be dark and clear for reproduction purposes.

Our ad takers will be happy to take smaller sized ads over the phone. We can provide simple line borders for you, if desired.

We also provide telecopier service at extensions 410 and 451.

The open line rate is $6.95 per line and there is a minimum size ad of 2 column inches (28 lines) at a cost of $194.60. Column inches are calculated by multiplying the number of columns wide by the number of inches deep your ad is. Depth increases in half-inch increments and we accomodate up to 5 columns. Column widths are as follows:

1 column--1 13/16" or 11 picas
2 columns--3 13/16" or 23 picas
3 columns--5 13/16" or 35 picas
4 columns--7 13/16" or 47 picas
5 columns--9 13/16" or 59 picas

If you wish a box number to be assigned to your ad, it will cost an additional $10.00.

First-time advertisers must send payment along with their ad.

For the ***Computerworld Bulletin Board,*** ads may be sent by mail, by telecopier or given over the phone. Space is available in ***one column by one inch deep units only.*** They are set up using a ***simple format with standard typefaces and no borders or logos are allowed.*** The cost of one standard unit is ***$99.00.*** These units may be combined to form deeper ads.

So, whatever the problem, simply supply us with the data we need to help you on your way to a solution, quickly and efficiently.

If you would like more information, or wish to reserve space, call our office nearest you.

Boston - (617) 879-0700 or
1-800-343-6474
New York - (201) 967-1350
San Francisco - (415) 421-7330
Chicago - (312) 827-4433
Los Angeles - (714) 556-6480

William J. Mills, Classified Advertising Manager

ENERGIZE YOUR CAREER AT ARIZONA PUBLIC SERVICE COMPANY

As one of the largest and most exciting employers in the state, Arizona Public Service Company offers excellent growth opportunities and career potential.

With our involvement in the construction and staffing of the 3 unit Palo Verde Nuclear Generating Station 50 miles west of Phoenix, we have immediate openings for Computer Professionals.

COMPUTER ENGINEERS

Successful candidates must have DEC/RSX 11, HW/MOD 400, SEL/RTM and/or MODCOMP/MAX 4 software experience.

COMPUTER TECHNICIANS

Requirements include a minimum of 2 years experience including chip level repair, on one or more of the following systems: SEL 32/55, MODCOMP Classic, Honeywell L-6 and 4500, CDC 1820, and PDP/11 Series.

In addition to the many attractions of living in the Phoenix area, APS offers a highly competitive salary and benefits program. Send your resume today including salary history to Charles Kilzer:

APS.
ARIZONA PUBLIC SERVICE COMPANY
P.O. Box 21666, Station 4015, CW 0614
Phoenix, Arizona 85036
An Equal Opportunity Employer M/F

ARAMCO IN HOUSTON
SERVICES COMPANY

EDP SYSTEMS PROGRAMMERS

Enjoy living and working in the heart of the Sun Belt

When Aramco Services Company in Houston hires you as a systems programmer, you'll gain experience that you probably could not duplicate anywhere. And you'll live in one of the fastest growing metropolitan areas in the country.

Phenomenal overseas operations depend on Houston people

Aramco is the key company involved in the development of the energy resources of Saudi Arabia. We need more systems programmers in Houston with a Math, Business or Computer Science degree. In each of the following positions we're looking for a self-starter who works well with colleagues and contacts, and without supervision. It's a high-visibility job for the qualified technical individual.

Senior Systems Programmer—This is a senior position which involves supervising a team of five people. You must have at least 8 years' experience with MVS/SE or SP1 internals, JES2-NJE and VSAM. If you have TSO Command Language, Panvalet, graphics support and systems tuning, so much the better.

MVS Systems Programmer—You'll get hands-on experience working as part of a team. You must have 5 years' experience in SE or SP1 systems, VSAM recovery, DASD management, and program product support.

Systems Programmer—You must have at least 2 years' experience with MVS specializing in program product support, in addition to support of IBM and non-IBM products including SAS graphics and MCAUTO packages. This position may develop into IMS, MVS, or a TP specialist job.

Excellent compensation and benefits

When you work for Aramco Services Company, you'll receive an excellent compensation, benefits, and relocation package, work in a pleasant environment, and have the additional advantage of paid parking or a company-subsidized van pool.

Interested? Send us your résumé and we'll get back to you soon. Write: Aramco Services Company, F3043-2, P.O. Box 4534, Houston, Texas 77210.

ARAMCO SERVICES COMPANY

CCI MEANS OPPORTUNITY!
using UNIX*, VAX, PDP 11's, M-68000's

Join Computer Consoles, Inc., one of the fastest growing companies in the computer field and the leader in development of fault-tolerant data management systems. We're located in Rochester, New York, a medium-sized city with all the cultural and educational advantages of a large metropolitan area, but the ambiance of a smaller, relaxed town. Due to our rapid growth, we have immediate openings for experienced individuals, preferably with B.S.C.S./E.E. or Math/Physics degrees.

SOFTWARE ENGINEERS

You will be responsible for mini/micro systems and applications programming using UNIX*, C and Assembly languages. We are looking for people at all levels, with primary emphasis on individuals with 2-8 years' experience.

SYSTEMS ENGINEERS

You will be responsible for the functional specification of communications systems and data base applications design. Senior level positions require a strong background in hardware design and systems architecture development. You should possess 2-8 years' experience.

**Trademark of Bell Laboratories*

We offer opportunity for advancement, attractive compensation and a complete benefits package. For immediate consideration, please send your resume, indicating position of interest, with salary history, in confidence to:

CCI COMPUTER CONSOLES INCORPORATED

Ms. Mary Lou Tetley
Computer Consoles, Inc.
97 Humboldt Street
Rochester, New York 14609
Equal Opportunity Employer M/F

NEW HAMPSHIRE
$25 - $60K

Applications and Systems Software

Micro/Mini/Mainframe

Management Advisory Services Inc

Colonial Office Park
48 Constitution Drive
Bedford, NH 03102
(603) 472-8844

Fees and relocation expenses company paid.

PROGRAMMER/ANALYST III

Midwest computer aided manufacturing firm is seeking a Programmer/Analyst for a career position in our software development department. Responsibilities of the position include defining the functional capabilities, devising and writing specifications of mathematical algorithms to perform these functions and developing software package to create 2 and 3 dimensional objects on a CRT. Applicants must have 2 years of related experience and a Master's degree in Computer Science and possess experience in Comuter Graphics Design, Macro II Assembly Language, PDP/11 Computers, NC Applications and Database and Display Management Systems Design. Starting salary is $22,320 per year. Send resume to:

Nancy Thompson
M.D.E.S. #2-76
309 Second Ave. South
Minneapolis, MN 55401

PROGRAMMERS

Our client is a dynamic Northern California based company who is a world leader in control theory, computers and electronics and is currently seeking highly skilled and talented individuals in the following fields.

SOFTWARE ENGINEERS:

With a BS degree and 2-5 years experience in real time, VAX/VMS Systems, Systems programs, Internals and VAX hardware with DEC PDP-11 computer knowledge including operation of RSX-11M Systems.

SOFTWARE EXPERTS:

Restructure or convert existing software systems from Prime-750 to VAX-750 or 780 machines. Programs must be tailored to meet specific customer requirements with a minimum of expense to modify the programs.

Our client offers outstanding professional challenge and growth opportunities combined with an excellent salary and benefits package. For immediate consideration please send your resume and salary history, along with a statement of who you do not want your information sent to, in confidence to:

BERNARD SCHANK ASSOCIATES, INC.
ADVERTISING

Confidential Reply Service
444 Castro Street, suite 504
Mountain View, CA 94041,
ATT: DEPT CWRM-3

*Our client is an equal opportunity employer

position announcements | position announcements | position announcements | position announcements | position announcements

At Intel, Every Assignment Comes with a Built-in Sense of Adventure

We are an ultra high technology company with a worldwide reputation for meeting specialized needs of a diverse customer base. This reputation continues to challenge our top professionals as practical applications for our products increase in complexity and sophistication. We are seeking additional creative professionals in the following areas to assist us as we continue to deliver the world's best products.

Senior Hardware Technical Writer

This position includes a mix of writing, planning, and project leadership for iAPX 432 Micromainframe™ technical manuals. Candidates must have a strong hardware and maintenance/diagnostic background applied to digital computer systems at the minicomputer or mainframe level. A BSEE or equivalent knowledge is required, plus proven expertise in planning and writing manuals for complex system-level products.

Senior Architecture Technical Writer

This position also includes a mix of writing, planning, and project leadership. iAPX 432 architecture reference manuals are used by operating system and compiler designers who need a thorough understanding of the iAPX 432 architecture. The manuals require both heavy tutorial material and a detailed referential section. Candidates must have excellent organizational and writing skills plus a strong computer science background. A BSCS or equivalent is required. An MSCS is preferred.

Qualified candidates should send a current resume to **Mike Gore, HF1-1-149, Intel Corporation, 5200 N.E. Elam Young Parkway, Hillsboro, Oregon 97123,** or call **(503) 681-5008.**

Additional opportunities exist with Intel in Phoenix, AZ, Santa Clara, CA, Austin, TX, plus Field Sales/Service openings throughout the entire U.S.

An Equal Opportunity Employer M/F/H

intel®
delivers solutions

IMS Products Development

Candle Corporation is a dynamic and fast growing computer software firm and is the leader in real-time performance monitors for large-scale IBM systems. We wish to add talented software developers to our IMS products staff. Candidates for these jobs must have strong assembler language programming and debugging skills. A familiarity with the IBM MVS environment (JCL, TSO, utilities, etc.) is also required. Beyond this, a familiarity with IMS and/or CICS, performance evaluation and tuning, and MVS internals is strongly desired. Send your resume (handwritten OK) to Eileen Brower or call (213) 470-2277.

!Candle

10880 Wilshire Blvd., Suite 2404, Los Angeles, CA 90024

A-127 Equal opportunity employer

BANKING ANALYSTS HOUSTON

Need Systems & Programmer Analysts with DDA, loan, and/or ATM background with COBOL and large IBM exposure. ALC is helpful. For further information contact:

George Bostick
Lyman Personnel
3100 Timmons, Suite 300
Houston, TX 77027
(713) 627-1110

DATA PROCESSING DIRECTOR CITY OF EUGENE, OREGON

Salary $29,352 - $36,468 a year, plus city paid retirement and excellent benefits. Highly visible management position directing data processing and word processing operations (35 employees). City operates with shared hardware, IBM 3033 N, 80 terminals, and growing mini-computer applications. Seeking an experienced manager to lead user-oriented data processing operation. Eugene (population 104,000) is a scenic university community located 60 miles from the Pacific coast and 70 miles from the Cascade Crest. For information, contact City of Eugene, Personnel Office, 777 Pearl St., Eugene, OR 97401, (503)687-5064. Applications accepted through July 2,1982.

EEO/AA Employer

SYSTEMS/ANALYST II

State funded
$22,981 to $28,701

Duties include participating in the design, writing and maintaining of a large interactive state-of-the-art computer system plus assisting users with briefings and documentations and supporting vendors operating systems. Requirements: Bachelor's degree in Computer Science or a computer related field, ie. Engineering or Mathematics and 2 years programming experience. Fluency in FORTRAN required. Combinations of training and experience may be substituted for experience in education requirements. Background check and polygraph examination required. Submit resume to: **P.O. Box 2668, Tucson, AZ 85701 by 5 P.M. July 1, 1982**

EOE

PROFESSIONAL SEARCH INCORPORATED

National HEADHUNTERS of the COMPUTER INDUSTRY

Fees Paid by
Our Client Companies
Corporate Headquarters
4137 S. Sherwood Forest
Suite 240
Baton Rouge, Louisiana 70816
504 292-9936

SENIOR PROGRAMMER

Harris-Stowe State College is looking for a COBOL Senior Programmer with a minimum of 1 1/2 years experience in Applications Development and 2 or more years of college-level training. IBM 8100/370/43XX/30XX experienced desired. Knowledge of TSO/SPF, JCL, SAF a strong plus. Please send resume and salary history to:

Director of Personnel
Harris-Stowe State College
3026 Laclede Ave.
ST. Louis, MO 63103

No Later than July 7, 1982.
Position available July 1, 1982.

AA/EOE

IDMS SPECIALIST to 35K

Our S NJ fortune 100 client reqs min 3 yrs exp w/IDMS in an OS environ. Must know CENTRAL VERSION PROCESSING & DML commands. Should be able to create & maintain schemas. Will dsgn & maintain systems using IDMS. Knlg TP monitor, CICS helpful . PAID RELO. Great Bnfts. IMMED INTV.

Contact: BOB GREENBERG
McFadden
811 Church Rd .Suite 214
Cherry Hill, NJ 08002
(609) 488-0500
(215) 569-3649

SUPERCOMPUTER SYSTEMS PROGRAMMER

The Purdue University Computing Center is going to install a CDC Cyber 205 Supercomputer. If you have experience in Vector Computation or in large scale programming projects, you may want to consider joining us. This is an opportunity for professional growth and achievement in an interesting and challenging position. We have an excellent working environment in an pleasant university town. You should have a BS or MS in Computer Science or a related area and relevant experience. Please send your resume, accompanied by a statement that explains why you believe you would be successful in this position to:

S. Rosen, Director
Purdue Univ Computing Center
West Lafayette, IN 47907

Purdue University is an Equal Opportunity/ Affirmative Action Employer

DATA PROCESSING INSTRUCTOR

Full-time, tenure track position at College of San Mateo, a public community college near San Francisco. MS or equivalent required in computer science or related field. BS with substantial work experience may be considered.
Work experience desired with IBM 370/4300 series with VM/370 and DOS/VSE. Recent teaching experience desired in such subjects as introductory computer and information science, operating systems, COBOL or other languages, systems analysis/design, and business applications.
Competitive salary schedule with fully paid medical and dental insurance for employee and dependants. **For information and application form, telephone promptly (415) 574-6288. Completed application form must be received by 4 pm on Tuesday, July 6.**

An Equal Opportunity Employer.

SOFTWARE SYSTEMS ANALYST

Loyola University is seeking an experienced SOFTWARE SYSTEMS ANALYST. Candidate should have a B.S. degree with a minimum of two years exprience on an IBM-VSE system. Competitive salary with excellent coprehensive fringe benefit package including free tuition, free hospitalization, fourteen paid holidays, life insurance, retirement, etc.. If you are looking for a challenging position in an academic environment, send resume in confidence with salary history to:

LOYOLA UNIVERSITY
c/o Personnel Office
6363 St. Charles Ave.
New Orleans, LA 70118
(504)865-3731

Equal Opportunity Employer M/F

SYSTEMS & DP MANAGER

Coastal Lumber Company is an aggressive, high growth manufacturing company with multiple locations in the southeast. We are seeking a systems-oriented DP professional, with experience in manufacturing systems design, telecommunications, COBOL, and supervision of professionals. This is an excellent opportunity to evaluate the information needs of the entire company and manage the development and implementation of systems to answer these needs. Salary: low to mid $30's plus bonus. Respond in confidence to:

CONTROLLER
P. O. Box 829
Weldon, NC 27890

ATTENTION S & P MANAGERS TECH SUPPORT MANAGERS

LARGE AND MEDIUM SCALE IBM

Potentially lucrative and exciting consulting opportunity with our Florida based executive search/management consulting firm. Will not interfere or conflict in any way with your employer or day to day duties. **Contact Ken Levinson or John Wichert at (305) 757-6800.**

PUBLICATIONS

COMPUTER SERVICES PERSONNEL ASSOCIATION

announces its 1982 Salary Survey on Data Processing positions within its membership firms. Cost $1,100.

Contact A.S. Hansen
312/234-3400
for further information

PRODUCT AND SERVICES GUIDE

The **Directory of Human Resource Services and Products.** An excellent planning source book for the informed decision maker. Includes firms who specialize in benefits, training, labor relations, recruiting, office systems, safety, security, etc. Details 1,100 firms, 122 pp. $12.00.

Human Resource
Communications Group
2355 E. Stadium Blvd.
Ann Arbor, MI 48104

HIRE A HOT SHOT IN THE CLASSIFIED PAGES OF COMPUTERWORLD

Call 800-343-6474 (or 617-879-0700) for more information.

SEMINARS/ CONFERENCES

RSTS & "DEC BASIC"

Optimization

SEMINAR
to be held
in San Diego area
JULY 22-23, 1982
for more information
please call or write:

Data Dialog
P.O. Box 27092
Escondido, CA 92027
(714) 744-8209

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Turnkey Systems and Real Estate.)

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are $97.30 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs $194.60 per insertion. Extra space is available in half-inch increments and costs $48.65. Box numbers are $10.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired: _____columns wide by_____ inches deep.

Issue Date(s):_____

Section:_____

Signature:_____

Name:_____

Company:_____Title:_____

Address:_____

Telephone:_____

Send this form to:
CLASSIFIED ADVERTISING, COMPUTERWORLD
375 Cochituate Road, Box 880, Framingham, MA 01701

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

BUY SELL SWAP

DPD
PERIPHERALS
3330 3410
3340 3411
3350 3420
BUY • SELL • LEASE
COMPUTER BROKERS INC.
2978 SHELBY ST.
MEMPHIS, TENNESSEE

901-372-2622

GSD
SYSTEMS
3 32
34 38
BUY • SELL • LEASE

MEMBER AMERICAN SOCIETY OF COMPUTER DEALERS

DEC
SYSTEMS & COMPONENTS
C.D. SMITH & ASSOCIATES, INC.
12605 E. Freeway,
Suite 318
Houston, TX 77015
713-468-2384
TELEX 76-2547 CDSMITH HOU

HEWLETT PACKARD
3000 SERIES
Most Common Configurations
Memory, Disk & Tape Subsystems,
Terminals, I/O Accessories,
Processors & Printers

1000 SERIES
21MX & 21MXE Series Systems
In Stock.
Same Day Shipments On
Memory Disc &
Tape Drives.

Buyers of all H.P. Surplus And Obsolete Systems and Parts
Call Us For An Immediate Quotation.

ADS
AIRBORNE DATA SYSTEMS
1112 Wrigley Way • Milpitas, CA 95035
(408) 262-5137

WHEN IS THE BEST TIME TO TALK TO RANDOLPH ABOUT LEASING A 3081?

Probably yesterday. And the sooner the better. But it's never too late, even if you have a machine installed. Talk to Randolph now . . . we can solve problems like these . . .
Long wait for delivery?
Stuck with a lease on your old machine?
Own a 3081 but need cash?
Machine installed on rental basis?

GET THE 3081 YOU NEED NOW . . . NOW.

Whatever your problem, we can tailor a lease that will fit your exact needs and let you start saving money right away.

SAVE $80,000 EVERY MONTH FOR THE NEXT 5 YEARS.

You can lease the same 3081 that IBM rents for $180,000 per month from Randolph for less than $100,000 per month. If you're renting an older machine, we can save you even more—and you'll get about 4 times the throughput in the bargain.

LEASING COMPUTERS IS OUR ONLY BUSINESS.

At Randolph, our people have an average of 18 years in the DP industry . . . from 360's to 3081's. They know all about alternative financing to be sure, but they also know their way around a DP department and the hardware in it.

WE LEASE MORE THAN 3081's.

Whatever your needs, now is the time to talk to Randolph. We provide leases for IBM 303X, 4300 systems and peripherals—disks, tapes—as well as 3081's.

UNIQUE FINANCIAL STABILITY.

We're an important part of one of the nation's oldest and leading banking institutions . . . The First National Bank of Boston. 18 years in computer leasing gives added assurance that Randolph will continue as the leader in the computer leasing industry . . . continue to live up to the terms and conditions of our agreements . . . provide upgrades . . . fulfill all of our commitments.

TALK TO RANDOLPH NOW.

We can solve a lot of problems for you . . . call Joseph B. Kelly, Jr., Senior Vice President.

537 Steamboat Road
Greenwich, Connecticut 06830
203 661-4200 • 800 243-5307

Randolph

A MEMBER OF COMPUTER DEALERS & LESSORS ASSOCIATION **RANDOLPH COMPUTER COMPANY** *A subsidiary of* **THE FIRST NATIONAL BANK OF BOSTON**

BANK of BOSTON 1784

WANTED!
SYSTEM/32 ***SYSTEM/34***
If you have a System/32 or System/34 to sell, we would like to buy it. Since we are dealing on behalf of already committed buyers, we can afford to pay top dollar for your computer.

CONTACT
Mr. William Bell
National Medical Computer Services, Inc.
7578 Trade Street
San Diego Ca. 92121
(714) 566-9920

ALL 360 & 370 SYSTEMS
CPU's & Peripherals
Purchased, Sold & Leased

CORPORATE COMPUTERS, INC.
Contact: Norm Burger

(203) 661-1500
115 Mason St., Greenwich, Conn. 06830
Member Computer Dealers Association

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

**** DEC ****

BUY—SELL—LEASE—TRADE—CONSIGN

— CPU'S —

11/23 11/34A 11/44 11/45 11/70 11/750

— DISCS —

RK05 RL01 RL02 RM02 RM03
RP04 RP05 RP06 RK06 RK07

— TAPES —

TM11EA TE16 TWE16 TJU45 TU45

— MEMORY —

11/34	11/44	11/45	11/70	VAX
MS11JP	MS11MB	MM11UP	MJ11BE	MS750
MS11LB		MF11UP	MK11BE	MS780
MS11LD			MK11CE	

— MISC. —

FP11A	FP11B	FP11C	FP11E	FP780
DMC11AL	DMC11AR	DMC11MD	DMC11DA	DMR11
DJ11AA	DJ11AC	DH11AA	DH11AD	DQ11
DV11	DZ11	DU11	DL11	DR11
RH780	RH70	RH11	KK11	RK611

THOUSANDS OF MODULES IN STOCK
SPARE FOR ANY DEC UNIT
CALL FOR QUOTE

**** NEW CONSIGNMENTS ****
SUPER PRICES

11/34A	11/45	11/45
256KB	3-RK05	Dual RP03
Dual RK07	TM11	TM11
VT100	LA36	LA36

NATIONAL COMPUTER EXCHANGE

800-854-7224

6980 Aragon Circle, Suite 5 • Buena Park, CA 90620

(In Calif.)714-522-1870 TWX:910-596-1499

EQUIPMENT AVAILABLE

Description	For Sale/Lease	Date
370/168		
3168 - U34 (2150, 2151, 3855, 4650, 6111, 7850, 7905, 3066-2 and 3067-3)	Lease Only	Now
3168 - U32 (2150, 2151, 2152, 3623, 3855, 4650, 6111, 7850, 3066-2, 3067-3, 2860-2, 2870-1, 2880-2)	Lease Only	Now
3168 - KJ (1435, 3855, 3066-2, 3067-2, 2-2870's, 3-2880's	Lease Only	Now
370/158		
3158 - U35 (1433, 1434, 1435, 7840,3213-1)	Lease Only	Now
3158 - U34 (1433, 1434, 1435, 2150, 2151, 4650, 6111, 7840, 4450, 3213-1	Sale or Lease	Now
3158 - JI (1433, 1434, 7840, 3213-1)	Lease Only	Now
3158 - J (1433, 1434, 1435, 4650, 7840, 7905, 3213-1)	Lease Only	Now
3042		
3042 - 2	Lease Only	Now

215/964-2000

Contact: Jack Northrop
Lease Financing Corporation
3 Radnor Corporate Center
100 Matsonford Road
Radnor, Pa. 19087
215/964-2000

LFC

Member Computer Dealers & Lessors Association

SALE • LEASE PURCHASE/ LEASEBACK

IBM SYSTEM 34

• 3740 Data Entry
• 3270 Terminals
MOST IBM SYSTEMS and Peripherals

(212) 673-9300

I.O.A. DATA CORP.
383 Lafayette Street
N.Y., N.Y. 10003

FOR SALE OR LEASE

3880-2 or 3
3380-AA4
3380-B4

Available 6/4/82

data3

Call Toll-Free
1-800-328-7938
or 612-941-9495 collect

FOR SALE

New and Used
Portable terminal

ORDER ENTRY DEVICES MSI88c & MSI88d

w/direct access data modem
w/wand scanner

CONTACT M. YOUNG (201)573-9700 x2682

FOR SALE NEW DATAPOINT 6600

120KB Memory
20MB Disks
230-340 LPM Belt Printer
Several 8200 Terminals

TDP SYSTEMS, INC.
120 Broadway, NY, NY 10271
(212)964-7797

7 1/2% Financing

1 Year old Prime 550 CPU
w/Mag Tape Drive
80 MB MHD Disk
URC 300 LPM Printer
Zeta FPS 53 Plotter
Also Terminals, Printers and other extras
Immediate Availability and assume financing at 7 1/2%

Systems Planning Corp. (owner/user)
(213) 820-8743
Ask for Carol Sagedy

INTERSTATE COMPUTER EXCHANGE

EXPERTS IN **IBM** BUY • SELL

SYSTEM/34

S/38 • S/32 • SERIES 1
5256 • 5251-11 • 5251-12
ALL IBM EQUIPMENT

- Each system customized to user's needs
- Guaranteed IBM Maintenance
- Up to 30% off list on System/34's
- We deliver and install all IBM systems, upgrades, and peripherals

WANTED

- Rental or Purchased System/34's.
- All Peripherals and CPU's.

Highest prices paid for System/34's and Peripherals!

LEASE

- Full ITC Guaranteed
- 20% - 30% off IBM Lease Rate.

Call PAUL CAYTON — 714/578-5410

IBM PROCESSORS PERIPHERALS

- BUY
- SELL
- LEASE

Carlyn Computer Systems, Inc.
5203 Leesburg Pike, Suite 1204
Falls Church, Virginia 22041
Call Collect (703) 820-3754

Computer Sales & Leasing

ASCD The American Society of Computer Dealers

SYSTEM
38•34•32•3

5110•5120

SERIES 1

5251	3262
5256	3287
5211	3276

3344	3741
3411	3410
3340	029/129

CCS!

SERIES/1

Buying & selling all models and peripherals of Series/1. Prompt delivery. All equipment sold is UNCONDITIONALLY guaranteed for IBM maintenance. New equipment discounts.

BUY - SELL - LEASE

- All IBM Systems
- Peripherals
- Tapes
- Disks

PIONEER COMPUTER MARKETING

PCM

Suite 680 4835 LBJ Frwy.
Dallas, Texas 75234
214 385-0354

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

BUY • SELL • LEASE

TAPE
3411•3410
3420
DISK
3340•3344
3350
Call Bob Ford
or Nelson Johnson

S/3
ALL MODELS
(8, 10, 12, 15)
S/32
S/34
SERIES/1
Call Gayle Drotar
Roger Odom
Ken Winzen

370 Systems
(Models 115-138)
4331
Call Donna Sage

370 Systems
(Models 145-168)
4341
3031•3032
3033•3081
Call Jack Harvey

Want our capabilities brochure? Send us your business card.

ECONOCOM
1755 Lynnfield Road
P.O. Box 17825
Memphis, Tennessee 38117
901-767-9130
CDLA Member Computer Dealers & Leasors Association

COMDISCO®

Your First Choice ☑ In The Second Market

IBM PROCESSORS

- ☐ 3081 — Available Throughout 1982 (D/K's) Will Lease/Finance Yours Or Ours
- ☐ 3033 — Available Now (N/U/AP's) Short Term Leases
- ☐ 3032 — Available Now Sale/Short Term Leases
- ☐ 3031 — Available Now Sale/Short Term Leases
- ☐ 4341 — Buy/Sell/Lease
- ☐ All 370's — Immediate Availability Sale/Month-To-Month Leases
- ☐ Amdahl — Short Term Subleases Available
- ☐ Memory/Channels — For All Models Immediately Available

IBM PERIPHERALS

- ☐ 3880-1/3830-2 — Immediate Availability
- ☐ 3350/70/75 — Immediate Availability
- ☐ 3880-2/3880-3 — 30-45 Day Availability
- ☐ 3380 A4/AA4 3380 B4 — 30-45 Day Availability
- ☐ 3330/40/44 — Immediate Availability
- ☐ 3803-1/2 and all models of 3420's — Immediate Availability
- ☐ 3705/04 — Call Karen Johns
- ☐ 327X CRTS — Call John Christopher 312-698-3000

We Can Put It Together

Eastern Regional Headquarters
(Connecticut) 203-655-1211
Boston 617-542-4005
New Jersey 201-568-9666
Midwestern Regional Headquarters
(Chicago) 312-698-3000
Michigan 313-644-1500
Western Regional Headquarters
(San Francisco) 415-944-1111
South Central Regional Headquarters
(Dallas) 214-258-6444
Fort Worth 817-534-1774
Atlanta 404-256-5956
Florida 305-428-3177
Canadian Regional Headquarters
(Toronto) 416-968-7135
International Headquarters
(Chicago) 312-698-3000
Latin America 305-666-6258
Paris (1)524.5270
Switzerland (21)71.09.35
West Germany (2434) 5048
Corporate Headquarters
6400 Shafer Court 312-698-3000
Rosemont, IL 60018 TWX 910-253-1233

A MEMBER OF CDLA AND LISTED ON THE NEW YORK STOCK EXCHANGE

Series/1
BUY–SELL–LEASE
CPU's—4952 & 4955
Disk—4962's/4963's
Printers—4973's/4974's
Displays—3101(Model 23)/4978/4979
Features—Most Available
We maintain an inventory of Series/1 Hardware. Most items can be shipped immediately.
CALL ROGER ODOM
901-767-9130

ECONOCOM
P. O. Box 17825 / 1755 Lynnfield Road
Memphis, Tennessee 38117-0825
CDLA Member Computer Dealers & Leasors Association

Buy - Sell - Lease
3741/3742
Short-Term Leases — All Models — Printers
S/34 S/32 S/38
Call: Steve Hough or Dick Geyer
Computer Marketing of America, Inc.
CMA
P.O. Box 90907
422 Acklen Park Drive
Nashville, Tennessee 37209
Call Toll Free
1-800-251-2670
In Tennessee: 615-297-7516

DASD
3370-3375
Immediate Delivery

L1-M2
UPGRADE 5/18/82
4341 N2 & P2
7/16/82 & 8/13/82
4331-K2
June - 1982

Tape Drives
3420
3410 8809
Immediate Delivery

Controllers
3880 3830
3803
Immediate Delivery

DASD
3350 3344
3340 3330 3310
Immediate Delivery

Printers
3203 1403
3287
Immediate Delivery

Control Units
3274 3272
3276 3271
Immediate Delivery

Display Stations
3278 3277
Immediate Delivery

We Buy, Sell & Lease IBM Processors and Peripheral Equipment

CDLA

Contact Bernie Gest 215-782-1010
Computer Marketing Inc.
7704 Seminole Ave., Philadelphia PA 19126

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

"THE BEST OPTION"

COMPUTER OPTIONS, INC.
612-544-8660
800-328-5718

BUY • SELL • LEASE

SERIES/1

(Systems and Peripherals In Stock)

"THE BEST OPTION"

Computer Options, Inc.
1660 S. Hwy. 100 #428W
Minneapolis, MN 55416
612-544-8660
800-328-5718

BUY • SELL • LEASE

S/34
S/38

ALSO
S/32, S/3, S/23

DASD
3340 3410
3344 3411
3350 3420

ANY TERM LEASE
3033S8
AVAILABLE NOW
CALL
CHARLIE ALBRIGHT
(212) 742-2241

WANTED
4341's
John Rellinger
FOR SALE
3375's
3350's
Kurt Johnson
3268-2's
3274's
3278's
Bob Sheldrick
(313)656-1900
REGIONAL COMPUTER SALES
805 Oakwood Drive, Ste.200
Rochester, Michigan 48063

Nation's Largest Dealer of used
MICRODATA
Equipment

50MB DISC DRIVES in stock, complete systems, and Microdata look-alike systems.

BUY • SELL • TRADE
CALL COLLECT
(206) 852-2045
COMPUTER WHOLESALERS
15926 SE Lake Holm
Auburn, WA 98002

SYSTEMS • PERIPHERALS • PARTS

DG DEC

NEW PHONE NUMBERS

Phil Thomas
305-392-2006

Bryan Eustace
305-392-2005

Jennifer Eustace
305-392-2007 TELEX 807-219

BUY-SELL-TRADE-LEASE
THOMAS BUSINESS SYSTEMS, INC.

DATA GENERAL
S140-768KB System
2 - 192 meg subsystems
2 - 6026 tape drives
Floating Point
Communication Chassis
32 ports
Also
6103-25 meg Drive
Impeccable Condition
Boynton Business System
145 Route 208
Montgomery, NY 12549
(914) 457-9221

FOR LEASE
3350's
Models A2F And C2
Below IBM Rates
All Models
B2's And B2F's
Also Available
With Or Without String
1-800-328-7938
(612) 941-9495

DEC
Equipment
VT-100 . . . . $1,375.
LA-36 . . . . . $895.
LA-120 . . . . $1,995.

Our Special
165 cps
Printer
Alanthus Model T-1210 with numeric keypad, paper out, HTAT/TFF, pedestal, and more only $1,295.

Anderson Jacobson Modems and Couplers
AJ 1234 . . $ 749.
AJ 1235 . . $ 849.
AJ 1256 . . $ 749.
AJ 1259 . . $ 849.

212A—compatible modems
Ven-Tel and Penril
from $795.

Brand new—in factory cartons

Full 30-day warranty included

Call today **800-638-6712** Telemarketing Dept., X 300

M/A-COM

M/A-COM ALANTHUS DATA
6011 Executive Blvd., Rockville, Maryland 20852
(301) 770-1150

11/23+
New with RL02's
CTS-300, CTS-500
or RSX
30% Off
Call Ralph Gordon
1-800-354-9206

COMPLETE HP SYSTEM
For Sale
HP3000 Series III-.5MEG
(1) ATC-16 Port
(1) 7970E Tape Drive 1600BPI
(1) 7920A Disk Drive 50MB
(1) 2640 Console
Available Immediatley
Best Offer Over $35,000
Terminals & Isolation Transformer Also Available
Contact Charles Finley
Finley & Associates
(213) 628-9846

For Sale
Basic 4 Computer
Model 400
160 CPS Printer
10 Megabyte Disk Drive
48K Memory, (1) VDT
Maintenance Certified
$7,000 - Must Sell
Ready Now - Call
(214) 637-0445
(Dallas, TX)

Hardware, software, problems, people, pricing, ethics, litigation, communication, macros, minis and micros.

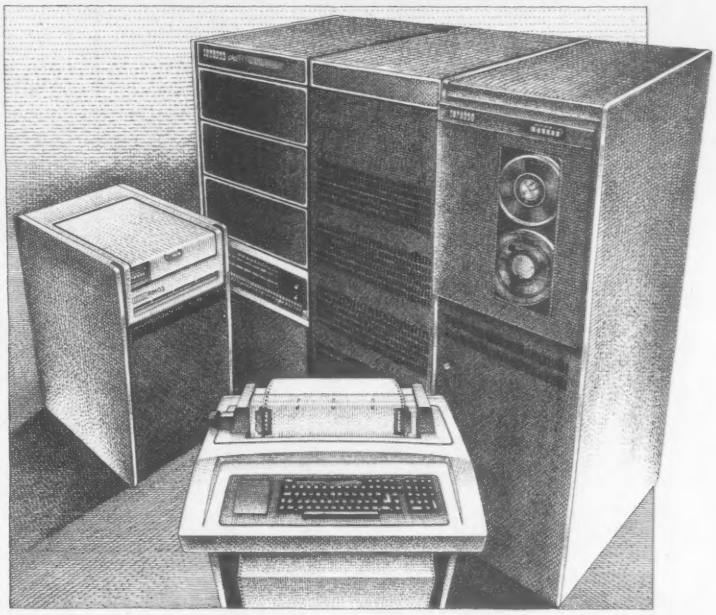
We like to make an issue of it. EVERY WEEK.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
375 Cochituate Road, Framingham, MA 01701/(617) 879-0700

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

BUY SELL
IBM
SERIES/1
5110-5120
S/32
S/34
S/38
S/3
ALL MODELS
SYSTEMS AND PERIPHERALS
AVAILABLE **NOW!**
(408) 425-7333
SOURCE
DATA PRODUCTS, INC.
555 SOQUEL AVENUE, SANTA CRUZ, CA 95060

RM03/TS11 based PDP-11/70 system.



Factory-refurbished and warranteed equipment from Digital.

When you buy your used systems directly from us, you get a full 90-day warranty, the exact same one as on new equipment.

And, your equipment is tested, debugged, and made to look new by the same experienced people who built it in the first place.

Call 1-800-258-1728.
In New Hampshire, (603) 884-6960.
Digital Equipment Corporation
Traditional Products, 16 Hampshire Drive, Hudson, NH 03051.

digital

TO: IBM COMPUTER USERS—SYSTEM 3, 34, 38.
FROM: **ANYLEX LEASING CORP.**
RE: LEASE FINANCING (Hardware and Software). EQUIPMENT ACQUISITIONS. DATA COMMUNICATIONS.

If you have a computer system or you are considering acquiring a computer system, you owe it to yourself to call ANYLEX.
From private placements to conditional sales, our leasing program is designed with our client's requirements in mind.
Our expertise is in IBM—GSD products and lease packages. We are ready to assist you in any related aspect of your installation.
Please call if we can be of any service to you.

ANYLEX
LEASING CORPORATION
1001 Ave. of the Americas
New York, New York 10018
(212) 719-9205
asca
We are members of the American Association of Equipment Lessors and the American Society of Computer Dealers

DEC SWA South West Automation DEC
BUY, SELL, LEASE, TRADE
11/03-23-24-34-44-70
Systems-Peripherals-Modules
Maintenance-On Call Or Contract
Time Sharing, A/P, A/R, GL, INV, Payroll, WP
11381 Meadowglen, Suite E
Houston, TX 77082
(713) 497-4467

NEW DEC Terminals
VT100 $1395
Including Advanced Video and Printer Port (Model VT102)
VT101 $970
Basic VT100 Family Video Terminal
LA120 $1995
Including Numeric Keypad and Universal Power Supply
All Cables & Interfaces 30%-70% Off
American Data Equipment Inc.
101 E. Carmel Dr.
Carmel, IN 46032
(317) 846-1718

HAVE YOU HEARD THAT

MEADOWLARK ENTERPRISES
Buys and sells warranteed new or used DEC equipment at the best prices. Find out for yourself why people do business with Meadowlark.
Call:
617 777-4666
For all your DEC requirements 11/70, VAX 11/44, 11/24, 11/23, 11/34

TCR
BUY SELL LEASE
IBM
SYSTEMS 3, 32, 34, 38 and PERIPHERALS
30-Day Availability

5251	5211	5256	3262	1403	3525
3741	3742	3276	3277	3278	3505
3410	3411	3340	3344	029/129	

Buy/Sell Used Decision Data Products
FEDERAL COMPUTER MARKETING, INC.
14001 Goldmark Drive, Suite 237
Dallas, Texas 75240 (214) 690-5187

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

DATA AUTOMATION COMPANY, INC.

SERIES 1

- BOUGHT - ANYWHERE - ANY QUANTITY
- Reconfigured and Staged by IBM Trained Technicians
- Refurbed to Exceed IBM Standards
- All Equipment Inspected by IBM
- Sold to Users Nationwide at Substantial Savings

4858 CASH ROAD • DALLAS, TEXAS 75247 • 214-637-6570

CDLA Member Computer Dealers & Lessors Association

DEC

Check out our unbeatable combination– huge inventory at the lowest prices anywhere!

Call toll free 800-328-7000

In Minnesota (612) 894-4020

(MSI) MIDWEST SYSTEMS, INC.

12117 Riverwood Drive, Burnsville, Minnesota 55337

Dearborn Giveth Attractive Lease Rates Available

Qty.	Machine Type	With Feature	Available
2	2501-B2		Now
5	1403-N1	8640	Now
2	1403-N1	No UCS	Now
2	3803-01		Now
	(Model 2 Upgrades On Order)		
2	3803-01	3551	Now
2	3420-05	3550, 6631	Now
16	3420-5		Now
	(Upgrades To 6 And 8 On Order For Model 5)		
1	3370-A01		Now

We do purchase leasebacks of any installed IBM equipment

dc dearborn computer company

Call Earl Jacobson (312) 827-9200

BUY • SELL

HEWLETT PACKARD

1000 SERIES AND ALL HP PERIPHERALS

CALL:

encore 213-393-4932

BUY...SELL...LEASE

IBM SYSTEM/34

Save up to 40%

F37 E35 D34 C23

5251 CRT's 5256; 5211

Fraxions EQUIPMENT CORPORATION

(212)279-0069

3033A16

Includes 3038-1, 3042-2 (2) 3037-1, and (2) 3036-1

Available August 15

User Owned - For Lease

Call - Bill Rummler 612-884-3366

Buy • Sell • Lease SYSTEMS DEC New & Used Equipment PERIPHERALS

CPUs 11/34 11/44 11/70

DISCS RP04 RP06 RM02 RK06 RL01

TAPES TE10 TU45

TERMINALS LA36 LA120 LA180 VT100

BAI

Carl R. Boehme & Assoc., Inc.

SPECIALISTS IN DIGITAL ENGINEERING

Phone (408) 727-2666 Telex 172337

See our ad on page 33.

FOR SALE OR LEASE

3268-2s

NEW ITC QUALIFIED

Early Ship Dates!

Call 214/258-0541

MCC METROPLEX COMPUTER COMPANY, INC.

320 Decker Drive • Suite 180 Irving, TX 75062

SELLING?

Sell your product or service in Computerworld classifieds.

Join the thousands of advertisers who use our classifieds because they get results.

You can find buyers for discs and DEC's, terminals and timesharing, software and System 370's.

More than half a million active computer people read Computerworld each week, and you can reach them efficiently in Computerworld classifieds.

To place your ad, or to get a rate card with complete details on Computerworld Classifieds, call or write:

Classified Advertising
Computerworld
P.O. Box 880
Framingham, MA 01701

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

375 Cochituate Road, Box 880, Framingham, MA 01701/(617) 879-0700

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

CMI

AMERICA'S LEADING SPECIALIST SERVING THE USED MARKET

3081 Memory Available. D & K Systems. Lease Financing for Your Systems or Ours

3033 Upgrades. S-N to N-U. Memory/Channels

3033-N12 Short Term Lease or Sale

3033-U12 Short Term Lease or Sale

3042 AP for 3033. Short Term Lease or Sale

SYSTEM 3 Models 12 and 15. Dennis Pennington

AMDAHL V6II - V7 - V8. Sale or Lease

3168 Upgrades. Memory/Channels/Features

30-60 DAY DELIVERY. **4341-M2** Sale or Lease Below IBM Rates

Wanted. **4341-L01** Call Now

2914 3203 3505/3525 3800 3211/3811. Mary Drangin. 3803/3420 Immediate Delivery. Tim Ryan

Communications. IBM 3705 IBM 3704. Pat Ducey

SYSTEM 34 SYSTEM 32 Dennis Pennington

3270

3350 3880 3830 3340 3370 3330 3375 3380. Buy/Sell/Lease. Pat Callahan. Mary Drangin

CMI Since 1969 CORPORATION
755 W. Big Beaver, 19th Floor, Troy, Michigan, 48084
TWX/TELEX: 810 232-1667 CMI CORP TRMI
(313) 362-1000

MARKETING
California (408) 773-1614 (415) 956-3183 (714) 752-8443
New Jersey (609) 645-7282
Tennessee (615) 449-6633
Texas (214) 385-0806
Montreal, Quebec (514) 871-1121
Paris, France Telex: 613910 CMI FR
Windsor, Ontario (519) 258-8910

CMI FINANCIAL SERVICES, INC.
755 W. Big Beaver, Troy, Mich. 48084
(313) 362-1000

Member CDLA

BROOKVALE DEC

LEASE•SELL•RENT•UPGRADE

PDP 8, 11/03, 11/04, 11/23, 11/24, 11/34, 11/44, 11/45, 11/60, 11/70, VAX/750, VAX/780

SYSTEMS•OPTIONS•SUPPLIES

Brand New Systems, Fully Warranteed, In Stock!

11/23	128 Kb MOS, dual RL02, RSX11-M	$16,575
11/44	256Kb MOS, dual RL02, LA120, RSX11-M	$34,950
11/780	1Mb MOS RM05, LA 120, VAX/VMS	$179,900
11/34A	256Kb MOS, dual RL02, DD11-DK, LA120, RSX11-M	$25,850

Other Systems Available - Call For Details

BROOKVALE ASSOCIATES
(800) 645-1167 • NEW YORK (516) 567-7777
40 ORVILLE DRIVE • BOHEMIA, NEW YORK 11716

MAKE THE RIGHT CONNECTION...
ON DEC® TERMINALS FROM DATALEASE

In Stock
Ready To Ship
VIDEO

VT100-AA	$1,399
VT101-AA	995
VT125-AA	3,295
VT131-AA	1,575
VT132-AA	1,650
VT18X	2,400

DATALEASE
AUTHORIZED DIGITAL TERMINALS DISTRIBUTOR
800-854-0350
Anaheim 714-632-6986 San Jose 408-287-7338
Los Angeles 213-748-3000 New York 516-231-0430

® Registered Trademarks of Digital Equipment Corporation.

BUY·SELL·LEASE·TRADE

PURCHASE LEASEBACK / RENTAL CREDITS

Write or call collect today!

SYSTEM 32's, 34's

4300's All Peripherals

360 Peripherals and I/O

370's All Peripherals and I/O

3270's CRTS, Printers & Controllers

MCC

(214) 258-0541
TWX 910-860-9285
METROPLEX COMPUTER COMPANY, INC.
320 Decker Dr., Suite 180
Irving, Texas 75062
Dedicated to Service With Integrity

DATA GENERAL

We Buy, Sell And Service
New And Surplus Systems and Peripherals
Call Or Write
Hanson Data Systems
(outside Mass. toll free) 1-800-225-9216
(within Mass.) (617) 481-3901
P. O. Box 27, Southboro, MA 01772

DATA GENERAL SPECIALISTS FOR
Surplus New & Used Equipment & Systems
with full depot repair facilities.
CALL US
WE TAKE THE TIME.
- WE CARE -
JM Associates
601 W. Chapel Avenue
Cherry Hill, NJ 08002
609-663-1115

XRXS COMPUTER SALES

SERIES/1 5110
S/34 S/38 S/3 S/32 S/23

We Buy, Sell and Lease All IBM Products

800-328-3884 612-929-7143
P.O. Box 24010 Minneapolis, MN 55424

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

Dealers in: IBM PROCESSORS/ PERIPHERALS

3350 ALL MODELS IMMEDIATELY AVAILABLE
3370 NEW AND USED 30-120 DAYS
3375 NEW 30-120 DAYS
3380 NEW 30-120 DAYS
—SELL OR LEASE—

ALSO AVAILABLE:

4331 Systems	Used-Immediate
4341 Systems	New and Used-Buy and Sell
Series 1	Want to Buy Any Model
System 3	All Models-Best Buys
System 32	Several-Immediate
System 34	Large and Small-Immediate
System 38	New and Used
3880	Mod 1-2-3 30 Days
3278	Mod 2-Immediate
3279	Immediate
3287	Mod 1 and 2-Immediate
3350	Several-For Lease-Immediate
3340	A2 and B2-Immediate
3344	Several Available
3411/3410	Several Available
3420	Most Models
3741/3742	Several Available

Member Computer Dealers & Lessors Association
MEMBER AMERICAN SOCIETY OF COMPUTER DEALERS

data3 computer corporation 11000 Prairie Lakes Drive Suite 600 Eden Prairie, MN 55344
Call Toll-Free 1-800-328-7938 or 612-941-9495 collect

SPECIAL OFFER TO CLASSIFIED ADVERTISERS IN

COMPUTERWORLD/MEXICO

The Hottest New Newspaper in the Hottest New Computer Market!

Looking for a new market for equipment, services, software or used computers?

Thirty thousand readers of this Mexican newspaper are looking for you.

Come together at $1.90 per agate line on a 5 column page like this one (minium 30 lines/one column).

COMPUTERWORLD/MEXICO
EL PERIODICO PARA LA COMUNIDAD DE LA COMPUTACION
Suplemento: Oficina del Futuro

Write or call: Alicia Lavastida.
Computerworld/México Oaxaca 21-2 México 7, D.F.
Tels.: (905) 549-3139 514-3219. We'll translate your ad for $5.00/page--and set type free.

3380-AA4/B4
3880-2/3
60 Day Delivery

3350 3370 3375
Immediate Delivery

Sale or Lease

Contact Your Local Office

Atlanta	404—256-5956	Florida	305—428-3177
Boston	617—542-4005	Ft. Worth	817—534-1774
Chicago	312—698-3000	Michigan	313—644-1500
Connecticut	203—655-1211	New Jersey	201—568-9666
Dallas	214—258-6444	San Francisco	415—944-1111
	Washington, D.C. 301—441-1000		

COMDISCO

FOR SALE OR LEASE

3148-K
3047-1
3340-A2
3340-B2
3803-1
3420-5(4)
2821-1
2540-1
1403-N1

The above systems can be altered to you suit your needs. Available Imediately

data3
Call Toll-Free
1-800-328-7938
or 612-941-9495 collec

Inflation Fighters

Quality & Savings

Slightly used. Money Back Guarantee. Full Reels. All External Labels Removed Guaranteed for use at 800 BPI through 6250 BPI.

2400' Reel $4.95 ea.
1200' Reel $4.25 ea.
600' Reel $3.50 ea.

All Tapes with Hanging Seals
We pay freight on orders over 200 tapes
All orders shipped within 48 hours
Call or Write
Computer Tape Mart
169 B New Highway
Amityville, New York 11701
[516] 842-8512

BUYING?

Whether you're looking for big computers little computers, terminals, printers, software, time sharing or services, you'll find it in *Computerworld* classifieds.

Pages of ads every week, with everything from Discs to DEC's from time sharing to terminals, and software for every size computer system. You'll find what you need in *Computerworld* classifieds.

Call 800-343-6474 (or 617-879-0700) for more information

1-800-433-4148
ALL
Systems, Peripherals and Upgrades
S/32, S/34, S/38, S/3s, S/1 & 4300s
CALL US NOW TOLL FREE!!

DANA MARKETING, INC.
In California Call (213) 372-8845
P.O. Box 3021
Redondo Beach
California 90277

! INVENTORY CLEARANCE !
From Stock
CDC* 9766
300 Megabyte Drives
- New in Manufacturer's Box
- Controllers Available

$11,500
Call Ann
714-632-6925

* REGISTERED TRADEMARK OF CONTROL DATA CORPORATION

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

617-272-8536

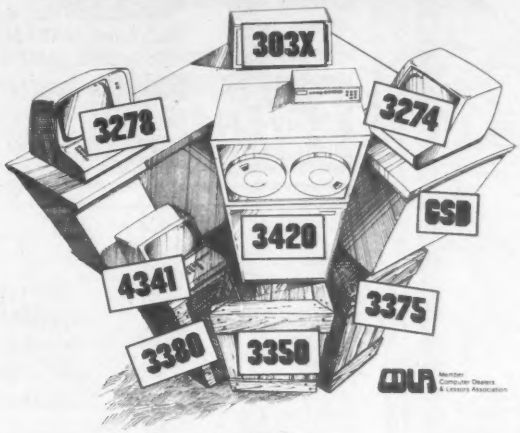
Alternative
wang
Specialists
WORD PROCESSORS OIS COMPUTER SYSTEMS

SYSTEMS & PERIPHERALS
- BOUGHT
- SOLD
- SERVICE
- UPGRADES
- TRADE-INS
- LEASES

...and we're faster!!!

CFR
CFR ASSOCIATES, INC.
18 GRANITE STREET
HAVERHILL, MA 01830

THE HARDWAREHOUSE IS HARD TO BEAT FOR PRICE AND AVAILABILITY.



Call Us Collect

UNITED STATES	
Boston: Eastern Regional Headquarters	**(617) 272-8110**
Washington, D.C.	(703) 521-0300
New York	(212) 832-2622
Philadelphia	(215) 293-0546
Syracuse	(315) 682-6120
Austin: Southern Regional Headquarters	**(512) 451-0121**
Atlanta	(404) 768-6535
Dallas	(214) 233-1818
Houston	(713) 629-4440
Chicago: Central Regional Headquarters	**(312) 789-9100**
Pittsburgh	(412) 922-8920
Ann Arbor	(313) 995-8717
San Francisco: Western Regional Headquarters	**(415) 283-8900**
Los Angeles	(213) 670-7994
Denver	(303) 534-7436
San Diego	(714) 231-2361
Seattle	(206) 447-1682
Phoenix	(602) 248-5978
Portland	(503) 228-7033
CANADA: Toronto	**(416) 366-1513**
Montreal	(514) 281-1925

BROKER/DEALER SALES AND LEASING
Phoenix: (602) 248-6848

168, 303X, 135, 145	
155, 138, 148, 158	**Ted Arbuckle**
Peripherals	**Keith King or Sandy Mitchell**
Communications & Terminals	**Craig West**
OEM Memory & 360	**George Beck**
GSD	**Wayne U. Smith**
Leasing	**Dave Revere**
Leverage Leasing	**Phil Iversen**

GREYHOUND COMPUTER CORPORATION
Greyhound Tower Phoenix, Arizona 85077, 800-528-6113

DEC
SYSTEMS • COMPONENTS
SYSTEMS • CONFIGURED
11/44 • 11/34 • 11/70
DISK DRIVES
RPO6 • RJMO2 • RMO2 • RMO3 • RKO7PA & EA
TAPE DRIVES
TWE16 • TS11 • TU10
MEMORY + OPTIONS
MK11CE & BE • MJ11BA & BE
DZ11A • FP11C
H.I.S., INC.
COMPUTER SUPPLIERS SINCE 1972
(714) 840-1393
16400 PACIFIC COAST HIGHWAY, #219
HUNTINGTON BEACH, CA 92649

FOR SALE
FOR LEASE

4341-K1
3278-A2
3880-1
3370-A1
3370-B1
3203-5
3411-3
3410-3

The above systems can be altered to suit your needs. Available 6/1/82.

data3
Call Toll-Free
1-800-328-7938
or 612-941-9495 collect

NEW USED
"WE WILL NOT BE UNDERSOLD"
TERMINALS, CRT's, PRINTERS

ADDS	NEC
DEC	QUME
DIABLO	TELEVIDEO
HAZELTINE	TEXAS INSTRUMENTS

Specialists In All DEC And Texas Instruments Systems And Components

SPECIALS

VT100AA's (New)	**$1,285**
Diablo 630KSR's (New)	$2,395
TI 745's (New)	$1,356
TI 820KSR's (New)	$1,685
Atari 800's (New)	$675
LA120AA's w/pad (New)	$1,850

Qume, Adds, TI (All) To 25% Disc.

The Computer Bank
315 Walt Whitman Road
Hunt. Sta. New York, NY 11746
516-549-5500

IBM
IBM 3375's
IBM 3370's

Please Call: (312) 943-3770
Forsythe/McArthur Associates, Inc.
919 North Michigan Ave.
Chicago, Illinois 60611

NCR USERS

We deal exclusively in NCR Computer Equipment. If you're buying or selling deal with the nations oldest and largest. Contact Gary E. Zywotko.

(612) 884-0758
Computer Connection Corp.
8120 Penn Ave. South
Minneapolis, MN 55431

DEC SYSTEMS
Software support, complete installation

Immediate delivery on
11/780, 11/750, 11/70, 11/44, 11/24, 11/23
New & used disk & tapes
RM05, RP06, RM03, RM02, TS11, TU77
Non DEC peripherals, CDC, Kennedy, Emulex
Terminals and options
VT-100, LA120, DZ11, FP11's, DUP11's

Call (408) 738-3368

IDS international data services
1020 Stewart Drive
Sunnyvale, CA 94086 TWX 172-189

Buy & Sell

FOR SALE OR LEASE

IBM PRINTERS
3268-2

AVAILABLE for 30-DAY DELIVERY

CALL: 800-528-6113
Craig Alan West

GREYHOUND COMPUTER CORPORATION

1 Year 2 Year 3 Year Lease

3033-U16	7/1/82
3033-U8	7/1/82
3330-S8	Now
3033-N8	8/1/82
3850 For 3033U	Now
3420-4's and 6's	Now

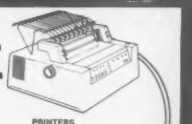
Call:
Charlie Albright
Sha-Li Leasing Associates
(212) 742-2241
39 Broadway
New York, NY 10006

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

MARION

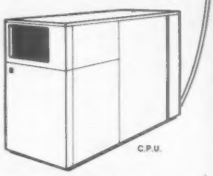
BUY•SELL•RENT

IBM SYSTEM/34


PRINTERS

DISPLAY STATIONS

- IMMEDIATE DELIVERY
- ALL SYSTEMS ARE FULLY RECONDITIONED AND RE-CONFIGURED TO YOUR NEEDS
- GUARANTEED IBM MAINTENANCE
- PERIPHERALS
- UPGRADES
- FEATURES
- SHORT TERM RENTALS
- LONG TERM LEASES AT GUARANTEED SAVINGS
- PURCHASE/LEASEBACKS


C.P.U.

A PHONE CALL CAN SOLVE YOUR EQUIPMENT PROBLEMS

TALK TO US ... NEW JERSEY (201) 343-4554
CONNECTICUT (203) 758-2409

WILLIAM MARION CO., INC.
84 KENNEDY STREET, HACKENSACK, N.J. 07602

DEC BASED SYSTEMS & SUBSYSTEMS

FAST DEC!

PDP • 11/24, 34, 44, 70
VAX • 11/750 + 780
DISCS • FROM 5 MB TO 256 MB
PRINTERS • FROM 30 CPS TO 900 LPM
MAGTAPES • TERMINALS • MEMORY
INTEGRATED OR ALONE • INSTALLED • MAINTAINED

Lambart SYSTEMS EXPERTS

FAST DELIVERY • LOW COST • FLEXIBILITY
LAMBART COMPUTING INC.
JFK INTERNATIONAL AIRPORT 147-10 181st STREET JAMAICA, N.Y. 11430
PHONE: 212-995-8525 TLX: 425476
Call: GEORGE ELLIS

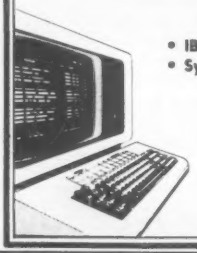
IBM For Less.

Lease Financing

- New IBM Equipment
- Purchase/Leasebacks of Installed Systems

Equipment

- IBM 4300's
- Systems 38's
- System 34's
- Peripherals



TexCom
• Equipment Leasing Services

Houston 713/789-3843
San Antonio 512/690-9826
Memphis 901/761-9336

Please Call For A Proposal

BURROUGHS

TD830 CRT's
B1855 Complete Systems
B4890 CPU
B950 Complete Systems
B9246-20 2000 LPM printer
Complete tape subsystems

ISI
2480 W. Alameda Ave.
Denver, Colorado 80223
(303) 922-8331
Telex: 910-931-0483

DLA Member Computer Dealers & Lessors Association

DEC-DG

NEW, USED BOARDS AND SYSTEMS

MOSTEK, DATARAM, NATIONAL COMPATIBLE MEMORY BOARDS

2 TO 3 YEAR WARANTEE

DIGITAL DATA SYSTEMS, Inc.
1551 N.W. 65 Ave., Plantation, FL 33313
305-792-3290
1-800-327-8662
TELEX-232005 ATT DIG

SELLING?

Sell your product or service in Computerworld classifieds.

Join the thousands of advertisers who use our classifieds because they get results.

You can find buyers for discs and DEC's, terminals and timesharing, software and System 370's.

More than half a million active computer people read Computerworld each week, and you can reach them efficiently in Computerworld classifieds.

SWAPPING?

Find the right deal in Computerworld classifieds.
Run an ad offering your old equipment and specifying what you want.
Read the ads from others.
Find a dealer or leasing company that works with trades and swaps.
Whatever you do, you have a good chance of finding what you want and getting rid of what you don't.

To place you ad, or to get a rate card with complete details on Computerworld Classifieds, call or write:

Classified Advertising
Computerworld
P.O. Box 880
Framingham, MA 01701
617-879-0700

RESULTS

Whether you're buying, selling, swapping, hiring or looking, you get results from Computerworld classifieds.

Maybe that's why Computerworld gets more classified advertising than all the other computer publications put together!

We Buy • Sell • and Lease IBM

3741/3742
•All Models
•Printers
(3715 & 3717)
•Many in Stock

•CPU's • CRT's • Printers •
•Short Term Leases/Rentals
•Purchase/Leaseback
Call BARRY TESSLER
PEARL EQUIPMENT COMPANY, INC.
P.O. BOX 24026 • 4717 CENTENNIAL BLVD.
Nashville, TN 37202 (615)383-8703

Pearl EQUIPMENT CO., INC.

FOR SALE BY OWNER
IBM
5230
Data Collection System
• (One) 5231 MOD 2 Controller, 2 loops
• Six 5235, badge readers MAG STRIPE
Call Ed Stavenick
REPUBLIC METALS
201-376-7200

IBM
3270
PRINTERS, TERMINALS & CONTROLLERS
Please Call: (312) 943-3770
Forsythe/McArthur Associates, Inc.
919 North Michigan Avenue
Chicago, Illinois 60611

IBM® PERIPHERALS
FOR SYSTEM/3 and 360/370/4300

• FOR LEASE
• FOR SALE

Take advantage of a special situation.

3340	3411	1403-N1
3344	3742	1403-2
3410	3741	3275
	3277	

PCPA/Professional Computer Placement Associates, a combined remarketing organization. Members:
International Capital Equipment, Inc.
One E. Wacker Dr.
Suite 2310
Chicago, IL 60601
Vargo Companies
48945 Van Dyke Ave.
Utica, MI 48087
(313) 254-2850

RP06-AA

1 1/2 Years old
DEC maintained
Immediately Available

$16,900

NPI
National Peripherals, Inc.
312-325-9700

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

→ NCR USERS

Are You Thinking of Trading Up ↑ ? or Down ↓ ?

Call Us for a Quote

SMITH ANDERSON CORP.
714-340-6688

Authorized NCR Systems Distributor – Nationwide
(New or Used Systems)
71-866 Highway 111
Rancho Mirage, Calif. 92270

We Buy & Sell

DEC

Systems Components

Digital Computer Resale

call:713 445-0082

600 Kenrick Ste C22
Houston, Tx 77060

IBM

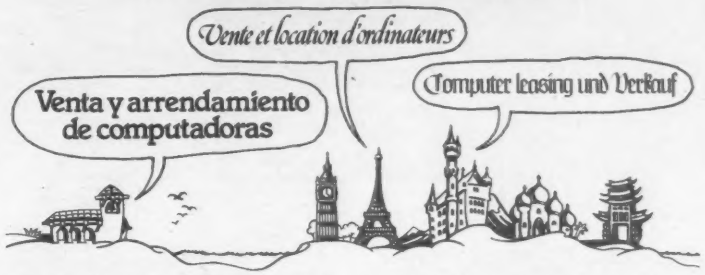
5110 / 5120

SYS 32 SYS 34

BUY - SELL
IBM MAINTENANCE GUARANTEED

NATIONAL DATA SYSTEMS, INC.
50 Congress Street
Boston, MA 02109
(617)720-1313

GREYHOUND MEANS COMPUTER LEASING IN ANY LANGUAGE.



Today, Greyhound Computer Overseas Corporation, one of the largest and most experienced computer leasing firms in the business, can meet your computer equipment requirements almost anywhere in the world.

We have a large portfolio of IBM computer equipment. And we have the financial strength to be able to lease, buy, sell, trade, purchase/leaseback or structure a leveraged lease for you.

Our Agents, Representatives and Affiliates throughout the free world may be contacted through our principal offices or our Dallas headquarters.

For your non-IBM equipment needs, domestic or worldwide, contact Don Haworth or John Hallmark in Dallas.

DALLAS (Hq.)
Greyhound Computer Overseas Corporation
4101 McEwen Road
Suite 374
Dallas, Texas 75234
(214) 233-1818
Telex: 163177 GCOC UT
(via TRT) 794500
GCOC FABR
TWX 9108605500
GCOC FABR

ENGLAND
Greyhound Computer (U.K.) Limited
Regal House – 7th Fl.
London Road
Twickenham,
Middlesex TW1 3QS
England
44.1.891.4986-88
Telex: 8512913329
GHCOMP G

FRANCE
Greyhound Computer France, S.A.
77 rue la Boetie
75008 Paris
France
33.1.256.3364-65
33.1.261.5107 X 363
Telex: 842642144
GREYHFR

GERMANY
Greyhound Computer Deutschland G.m.b.H.
Rottenbucherstrasse 32
8032 Graefelfing
West Germany
49.89.85 10.59
Telex: 841524168
GREYHD

MEXICO
Greyhound Computer de Mexico, S.A. de C.V.
Bosque de Duraznos
69-1106
Bosques de las Lomas
Mexico 10, D.E
Mexico
905-596-4457
905-596-1860
Telex: 3831776414
CAVAME

SWITZERLAND
Greyhound Computer, S.A.
1, Place de la Gare
1260 Nyon
Switzerland
41.22.61.27.54
Telex: 845527786
GREYD CH

GREYHOUND COMPUTER OVERSEAS CORPORATION
(214) 233-1818
A subsidiary of Greyhound Computer Corporation

DEC SALE
1123 & 1123+ Systems
30% Off

TERMINALS

VT 101 CRT Terminals	$995
VT 102 CRT	$1390
LA36 With Accoustic Couplers & Forms Option	$990
LA38-AA Decwriter IV	$1250

MODULES

DZ11-A	$2375
DZ11-B	$1890
DZ11-E	$3700
DLV11-J	$510
MS11-MC 11/44 Memory	$7850
MS750-AV 11/750 Memory	$8900
MS780-DB 11/780 Memory	$8900

DISKS

RL02-AK	10MB	$2675
RM05-AA	256MB	$24,500
RM80 Winchester		$14,900

SOFTWARE

QE099	Vax COBOL	$7000
QE100	Vax FORTRAN	$4500

Other DEC items Available On Sale
Call for Information
American Timesharing Inc.
Brent Rice
800-354-9206
In Kentucky
606-223-5311

Call Us First or Last But Call Us For Sure!

Buying • Selling • Leasing

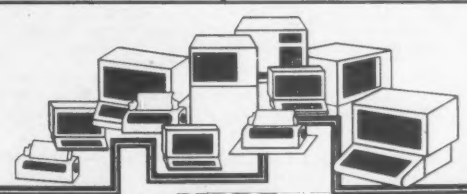
IBM Systems & Peripherals

System 3
System 32
System 34

5110 • 5120

5251 (011 & 012's)
3741 • 3742
029 • 129

Southern Data Systems
2400 Crestmoor Road
Suite 305
Nashville, TN 37215
(615) 385-1177 or
800-251-2614



IBM

SERIES 1 S/32 S/34 S/38
TAPE DISK PERIPHERALS
UNIT RECORD 029-129
5110-5120 3741 3742

Ameritex Computer Corporation

MEMBER ASSOCIATED SOCIETY OF COMPUTER DEALERS

214-934-9151
GENE NICHOLL TOM KLEEFISCH
14229 PROTON • DALLAS, TEXAS 75234

For Sale Or Lease
Available Now
3776 Mod 2 Terminals
3279 2A Color Terminals
3274 D31 Local Controllers
3274 C31 Remote Controllers
3268 Mod 2 Printers
3287 Mod 2 Printers
3287 C02 Color Printers
3278 Mod 2 Display Stations

Want To Buy
1377 Memorex CRT's

Call Diane Prestigomo
Leasing Dynamics, Inc.
1717 East Ninth Street
Cleveland, OH 44114
(216) 687-0100 CDLA

For Sale
DEC
RP06
Will Rent
Or Lease
(713) 445-0082

JUNE SPECIALS

PDP 11/23	CPU Boards w/ 32KB and Chassis	$ 2,600.00
PDP 11/34A	CPU Boards (M8265/8266)	$ 2,750.00
Model 9100	Kennedy Model 9100 75 ips	$ 4,990.00
CDC 9762	80 MB Disk Drive	$ 6,300.00
CDC 9766	300 MB Disk Drive	$11,500.00
RK06	14 MB Disk NEW no pedestal	$ 1,990.00
LA180-PA	Decprinter 180 CPS	$ 795.00
LA35-CE	Decwriter receive only	$ 450.00

CALL TODAY -
QUANTITIES LIMITED

(916) 635-9340
WEX West Coast Computer Exchange Inc.

IBM UNIT RECORD EQUIPMENT
DISK PACKS, DATA MODULES, MAG, TAPE, DISKETTES

SALE OR LEASE

026	084	129	548	2316
029	085	514	555	3336(1)
082	087	519	3742	3336(11)
083	088	526	360/20	3348(70) Cartridges

Highest prices paid for used packs & machines.

Thomas Computer Corporation
600 North McClurg Court, Chicago, IL 60611
800-621-3906 Ill. 312-944-1401

Authorized Distributor
Memorex
CDC
3M
BASF

Available Now

11/44

35% OFF

M.E. Congdon (203) 728-6777

Quodata

For Sale
IBM 370-158 Computer
Ser. #3158/23948-(IBM Maintained-Good Condition)

Features:
1.5 Megabytes IBM Memory, 1433, 4650, 7840 3213, 3950-1401, 5450, 8740, 9080, 9313-3330, 9824, 3213.

NOTE: IBM 370-158 Shall be Certified at Deinstallation.
Intel 2 MB Memory Unit with Frame and Cabinet Ser. #321-(Intel Maintained) (OEM Memory) Raised Floor (In Computer Room)-9 1/4 Inch High, Consisting of 386 Panels, 4 Sq. Ft. Each; with Pedestal.
Available on July 14, 1982. For sale by Sealed Bid. To obtain Bid Specs contact:

Procurement Division
Montgomery County Public Schools
850 Hungerford Drive
Rockville, MD 20850-1747
Ph (301) 279-3555
Bids due June 28, 1982, 3 P.M. EST

buy sell swap | buy sell swap | buy sell swap | buy sell swap | buy sell swap

SERIES/1

- IMMEDIATE AVAILABILITY
- FEATURES & PERIPHERALS SOLD SEPARATELY
- GUARANTEED FOR IBM MAINTENANCE
- SYSTEMS CONFIGURED TO YOUR REQUIREMENTS
- IN-HOUSE STAGING PRIOR TO SHIPMENT
- REFERENCES FURNISHED

4952	4969's
4955	4973
4959	4974
4962's	4978
4963's	4979
4964	4997's
4966	4999's

All Features

SPECIAL — THIS WEEK

4955 - D Processor 64K.....$5,000.00

FRONTIER®
COMPUTER CORPORATION
4575 S. Westmoreland • Dallas, Texas 75237
214 - 330-7243

BUY SELL LEASE
Series/1
Peripherals & Features
Systems 32-34-38

5110-5120
3776-3777
3741-s-1 & 2;3742's
3271-3272-3277-3286/88
029-129-3747-3540
3340-3344-3350-3370-3375
360/30-40-50 & 65
5251-11's &12's
Various Items of Unit Record Equipment
082-083-084 548-557 059-085

BEDFORD COMPUTER MARKETING,INC.
4141A Greenbriar
Stafford,TX 77477
Tel.(713)491-6757

DEC SHOPPER'S LIST

Item	Unit Cost
AR11-K	$ 660
DR11-C	400
DV11-AA	2,090
DV11-BB	1,440
DV11-BC	1,540
H960-DH	900
MK11-CE (2)	5,500
MM11-DP (16)	100
RH11 Complete (New)	5,000
RK06 (2)	1,500
RK611 CTL Complete	3,500
DMR11-AC (4)	4,200
TE10W-EE	1,500

C. D. SMITH & ASSOCIATES, INC.
(713) 468-2384

DEC FOR SALE by OWNER

(2) RP06-AA Disk drives
(2) M7258 LP Interface
(1) M7800 Terminal Interface
(1) 19" Rack-mount cabinet 51" high

CALL TERRY FYFE 314-429-7300

50% OFF LIST!

TI "SILENT 745" TERMINALS

Over 200 terminals in excellent condition. Under continuous Texas Instrument maintenance.

Available immediately:

Call collect for more information.
(212) 997-6075 - Russ White

For Sale
System 34's
Any Configuration
Wanted
5251 Models 11 & 12
5256 Model 3's
System 34-D34 - August
Jim Kelley
Coastal Computer Marketing
(213) 986-4830

BUSINESS OPPORTUNITY

DISTRIBUTORS WANTED FOR BURROUGHS COMPATIBLE CRT DISPLAY TERMINALS

We need distributors who are in major U.S. cities currently in the Burroughs computer market to sell and service our new terminal compatible with the Burroughs TD 830 and MT 983. Excellent profits for real workers.

Call Zeke Copp
3 PM, INC.
30881 Schoolcraft Rd.
Livonia, MI 48150
(313)427-2000

THE PROFITABLE TRANSITION!

If you have thought about owning & operating your own business, ROMAC® may be your answer. We are a successful personnel consulting firm with 15 locations, serving the accounting, finance, data processing & banking professions. ROMAC® professionals come from firms such as Price Waterhouse, Arthur Andersen, Coopers & Lybrand, Peat Marwick, IBM, Digital Equip., Software Intern'l, Honeywell, Marine Midland Bank, State St. Bank & Central Penn Nat'l Bank. We are seeking franchisees with experience in accounting, finance, data processing, banking or personnel consulting. If you have experience in one of these fields, some capital to invest & a sincere desire to succeed, ROMAC® can provide you the challenge & satisfaction of owning your own business. For additional information, please call.

ROMAC® 800-341-0263

In New York: Franchise offerings made only by formal prospectus.

BUYING?

Whether you're looking for big computers little computers, terminals, printers, software, time sharing or services, you'll find it in *Computerworld* classifieds.

Pages of ads every week, with everything from Discs to DEC's from time sharing to terminals, and software for every size computer system.

You'll find what you need in *Computerworld* classifeds.

Call 800-343-6474 (or 617-879-0700) for more information

THE BULLETIN BOARD

A Low-Cost Way to Sell Hardware and Software in Computerworld

What is The Bulletin Board?

It's a classified section in Computerworld designed especially for the selling and buying of individual pieces of hardware in a convenient, low-cost format. It is especially suited to companies that have a piece of used equipment they want to sell. For one low price, you can inform more that half a million Computerwold readers around the country of your equipment's availability.

How Does The Bulletin Board Work?

Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is the maximum width and no units of less than one inch are available.) Ads are arranged under headings (such as "IBM", "DEC" or "Printers"). The headline of the ad is set in larger, bold type, and should contain the standard equipment identification. The body copy should describe the equipment very briefly and give the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software.

Price for each standard unit is only $99. (One unit minimum and no fractional units available.) Anyone can place an ad, but no agency commissions are paid, no quantity discounts allowed, and no credit toward rate is given for contract advertisers who advertise in other sections of Computerworld. It's a simple and effective system for buying and selling hardware and software.

How to Place an Ad in the Bulletin Board.

Ads are accepted in the mail, by phone or by telecopier. Ads can be accepted up until the Monday before issue (7 days in advance of issue date). You should write out your ad before submitting it. (The standard size will hold approximately 25 words of copy.)

Once you've written your ad, send it in with the coupon below or call one of our ad-takers. (If your company has never advertised with us before we request a check with your order.)

Remember that all ads are standard. No special typefaces, no borders and no logos are allowed. Ads are set on a six-column page in our classifed section under the heading "The Bulletin Board.". We assume no liability for errors beyond the price of the ad in the case of material errors.

ORDER FORM
COMPUTERWORLD
BULLETIN BOARD

Issue Date(s): _____

Signature: _____

Name: _____

Title: _____

Company: _____

Address: _____

Telephone: _____

Send this form to:
COMPUTERWORLD BULLETIN BOARD
375 Cochituate Road, Box 880
Framingham, MA 01701

617-879-0700 800-343-6474

The Bulletin Board

Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease

DEC

SPECIALS

11/44 w/2-RM02	$59,000
MS11LD	$1,850
FP11F	$2,050
11/34A CPU Set	$1,750
DD11 CK (NEW)	$275
MF11UR	$950
MM8AB	$900

BUY & SELL
WESTERN DATA SALES, INC.
(213)539-8917

MAINTENANCE
PDP-11/03 THRU 11/70
PERIPHERALS: CDC, PERTEC, PRINTRONIX & OTHERS
Servicing: San Jose, Monterey, Santa Rosa, Sacramento, San Francisco, Santa Cruz
408/293-5202
SCIENTIFIC RESEARCH MANAGEMENT CORP.

For Sale
In Factory Cartons
Datasystem 315+
D315A-WY 128KB, VT100
RLV211, RX02, (4) SLU's
CTS-300/L.O.-Dectype/L.O.
L.G.S. Financial Services
504-888-2885 X215

NEW D346D-JY
11/24, RL02's,
256K, LP11, DZ11A
$33,000
USED RL01's
$1,200 each
Call ED (800)241-6805

DEC LA120
Rent $83 Month
Sale $1495
Lease To Purchase
Available
(415) 858-1638

DEC MEMORIES

11/34A Cache KK11A	$1785
70 1/2MB, MK11CE	$3750
11/70-11/60 128KB	$1485
VAX780 1MB, MS780DC	$6750
11/44 256KB, MS11MB	$2850
11/34 256KB, MS11LD	$1950
11/34 128KB, MS11LB	$1285

CALL RAY (617)275-6800

DEC NEW & USED

MS11-LD (NEW)	$1,650
11/34A-YE (NEW)	$10,500
FP11-F (NEW)	$1,950
FP11C (NEW)	$4,950

Systems • Options • Peripherals
LAKEWOOD COMPUTER CORP.
3260-9 Keller St., Santa Clara, CA 95050
(408)266-2545

DEC RSTS TO MICRO
MICRO TO DEC RSTS
Online file transfer communications package. Accurate & complete exchange of any disk file between your APPLE (or any CP/M) micro, and a DEC PDP-11 RSTS system. $895. For details call or write **Sandira Young.**
GEORGE W. HALLAHAN & CO.
1660 Soldiers Field Rd. Boston, MA 02135
(617)782-6100

RSTS SECURITY LOCK-11
Dave Mallery-NDD
215-364-2800

For Sale
DEC TAPE DRIVE
TWE16AA In Corporate Cabinet
800/1600 BPI
w/RH70 Controller
Price-$12,500
Less than 3 years old
Has been under critical DEC maintenance
Call: EAS SYSTEMS
(201) 221-1233

Call
1-800-343-6474
to place your ad.

HONEYWELL

200/2000 SERIES
BROWN COMPUTER SERVICE, INC.
BUYS, SELLS/LEASES, and MAINTAINS:
Complete and partial systems & peripherals with up to 50% discount on current HONEYWELL prices.
Exclusive HONEYWELL Dealer.
In Business Since 1976.
Call or write W. E. Brown at:
1000 Southcrest, Arnold, MO 63010
(314)644-3323

MODEL 23 $7,500
Mod 200/400
128KB, .5MB Disk
VIP7205, HISI
120 CPS Printer
Also Available with 80MB Disk
Call: Knaus Systems, Inc.
4825 N. Scott St., Ste. 108
Chicago, IL 60176
(312) 671-4630

ULTIMATE SYSTEMS
All Configurations and Upgrades
VIP7200 CRT's
$1,287 Purchase
$62/mo. rent
Call: Knaus Systems, Inc.
4825 N. Scott St., Ste. 108
Chicago, IL 60176
(312) 671-4630

LEVEL 62
Honeywell Maintained
Available Now
Central Processor
256 K mem, 120 CPS Console
Best Offer Over $8,000
1200 LPM Printer
Print Belt & Stacker
Best Offer Over $30,000
Contact C.E. Waddell (904)677-4453

LEVEL 62-64
LEVEL 6
SERIES 200-2000
SYSTEM OR PARTS
URS
66 Montvale Ave.
Stoneham,Ma. 02180
(617)438-4300

LEVEL 6 DPS 6
WANT TO BUY
VIP 7200's CRTs
DCM 9114 Current Loop Pacs
Complete L6 Systems & Parts
FOR SALE (HIS Maintainable)
DCM 9103 Dual Sync Pacs $350
DCM 9104 Single Sync Pacs $250
DCM 9110 Auto Call Pacs $250
Complete L6 Systems & Parts
CD SYSTEMS INC. 402-330-2310

LEVEL-6 & DPS-6
Maintenance, Software, Timesharing
BUY - SELL - RENT - TRADE-IN
Best Discount
Call: Knaus Systems, Inc.
4825 N. Scott St., Ste. 108
Chicago, IL 60176
(312) 671-4630

LEVEL 6 & DPS 6 EQUIPMENT
NEW & REFURBISHED
Systems • Peripherals • Memory
CRT's • Applications Software
SUBSTANTIAL DISCOUNTS!!
Boudreau Computer Services Ltd.
100 South St., Hopkinton, MA 01748
(617)435-5355
TWX 710-347-7575

Complete
Honeywell Level 62 System
Optional oil and gas software.
Will sell all or part.
Available 7/1/82.
Contact:
Prairie Producing Co.
Becky Wheat
(713) 658-8413

More Bulletin Board on the next page.

SPERRY UNIVAC

(2) 1900 8.8 MB
CADE SYSTEMS 128KB
1600 BPI tape
Line Printers
Acceptable for Univac Maint.
75% Off UNIVAC List!
ANRIX CORPORATION
Tel.(602)949-0105

DATA GENERAL

C330 System 512KB	Call
C350 System 512KB	Call
8701 512KB MV8000 Mem	$7,000
8656 256KB Eclipse Mem	$3,900
8387 256KB Nova 4 Mem	$4,500
8687 256KB S140 Mem	$5,000
6021 9-Track Sub-System	$6,500
6027 9-Track Sub-System	$7,800
6040 Dasher	$1,000
6089 LP2 Printer	$3,200
6053 D2 CRT	$1,400
6106 D100 CRT	$1,000
6061 Disk Sub-System	$22,400
6061-A Disk Add-On	$19,400
6122 Disk Sub-System	$33,000
8642 Burst MUX	$2,100
4251 Com Chassis	$1,100
4255 ALM-8	$1,350
4258 ALM-16 (8 Line)	$1,000
4215 600LPM Printer	$8,500
D.G. to Printronix Interface	$1,100

INT'L. COMPUTING SYSTEMS
(612)941-2941

MAC
NEW & USED DG EQUIPMENT
NOW AVAILABLE
- **CS40-5** (2) 6053, LP2
- **CS 50-5** 25MB Disk
- **6061-H** 192MB Disk
- **Board Replacements & Repairs**

MINI
ALTERNATIVES CORPORATION
3717 Mt. Diablo Blvd.,Ste.102
Lafayette, CA 94549
Call Donald G. McAlister
(415)284-4421
TWX 910-481-3605

S/250 System	$45% off list
8656 Eclipse 256 KB	$4000
6061-H 192 MB disk drives	CALL
6061-A 192 MB disk drives	CALL
6026 1600/800 bpi tape drives	CALL
6064-H fixed head dieks	call
D/100 CRT terminals	$995
CS/50 w/20 MB, 6021 tape	35% off list
MP/100 systems	CAll
S/140 system	35% off list

MBS, INC. • (608)273-2966

Nova 3/12	ALM 8
ULM 5, New	Comm Chassis, New
Nova 3 Mem 64KB	
Nova 4C 64KB, RTC New	
Nova 4s 64kb New	
6070 S/S Used	
DG 4215 300 LPM Prtr. S/S	**$9,800**

SYSGEN DATA LTD.
68 Hidden Ridge Dr.
Syosset, NY 11791
(516)496-7777

FOR SALE
DATA GENERAL
(1) 6026 800/1600
BPI 75 IPS
Tape Drive/Sub System
Call: Greg
DATA BREEZE
(312)696-3300

IN STOCK - IMMEDIATE DELIVERY

DG 8392H Nova 4/S (new)	**$3,750**
DG 6070 20mb Disk S/S (Like New)	**$6,900**
DG 6100 25mb Winch + 1.25 Floppy	**$8,250**
DG 8388 Floating Point for Nova 4X	**$2,750**
Disk Packs for Zebra 6060	**$250**

WESTERN COMPUTER SYSTEMS, INC.
1001 N.Mountain St., Carson City, NV 89701
(702)882-7979

IBM

SELL OR LEASE

(2) 1403-N1 w/UCS	$3,200
3 w/(2)3615,8637,8638	$5,200
3272-2 w/(7)3250	$4,100
(18) 3277-2 w/4633 (Qty. Disc.)	$1,650
3033-U8 or U16	Lease
(1) 3038 MP Comm. Unit	Lease

WANT TO BUY MOST IBM EQUIPMENT
OCM, INC. (913)381-2406

IBM 3864-1 & 2 MODEMS
IBM 3872-1 MODEMS
24 & 4800 BPS MODEMS
(from Gen. Data Comm. & Racal- Milgo)
Wanted: Genesis One G77 CRT's
M & M DATA PRODUCTS, INC.
406 Main St., Metuchen, NJ 08840
CONTACT: MIKE SIMON
Tel.(201)494-2610

Sale or Lease

3340-A2	**$7,000**
3340-A2 w/8150	**$8,000**
3333-11	**$14,000**
3330-11	**$10,500**

All Units Available Now
CALL PATTI LAMIA
Hastings Marketing Corp.
(313)649-3050

IBM

SALE OR LEASE
3380-AA4
3380-B04
Shipping 6/4/82
Al Morrill
DATA 3 COMPUTER CORP.
(612)941-9495
(800)328-7938

SYSTEMS 34/38
Lease or Sale
WANT TO BUY S/34's
(FOR INVENTORY)
Models & Peripherals
WE PAY CASH
LEAS PAK INTERNATIONAL
Tel.(817)268-0023

For Sale or Lease
IBM 3420
IBM 3420-08's
IBM 3350's
Call Earl Minter
(918) 481-5371

FOR SALE
(1) 3742 MOD 1
(3) 3741 MOD 2
w/communications
(3) 3715 MOD 2
All under IBM maintenance
Call Jene Skillman
INDUSTRIAL CATERING CO.
(214)264-1691

For Sale or Lease
Tranportation paid
Available July 1
3803 Model 1 with dual density
(2) 3420 Model 3 with dual density
(3) 3420 Model 3
3340 Model B2
029 Model A22
029 Model C22 (interprets)
MCI COMPUTER CORP.
Contact Robert Frank-(415)254-2638

SALE OR LEASE
4341-K1
3278-A2
Available 6/1/82
Al Morrill
DATA 3 COMPUTER CORP.
(612)941-9495
(800)328-7938

Want to Buy
5251's All Models
8775's All Models
CALL PAT
(404) 998-1001

FOR SALE OR LEASE
5415 D25 BSCA LDA

3340-A2	3344-B2
1403-N1	3411-1
3277-2	
3747	3340-B2
3741	3742

EXCELLENT PRICE
INTER-AMERICAN DATA, INC.
(404)447-9762

IBM 3033
Installed July 12, 1979
3033-U4 Processor (4 megs) plus STC 3733-8 8 megs of memory. Total 12 megs of memory.
(IBM Memory Version, Type 2, Double Density)

7850 (2)	Two Byte Interface
9201	1st Channel Group - 7850
9202	2nd Channel Group - 7850
S20587	Extended Control Storage
EJ1156	VM Assist
9903	208 Volts
9062	Sunrise Yellow
3036-1	Console
9903	208 Volts
3037-1	Power and Coolant Unit
9903	208 Volts
9060	Willow Green

All Equipment presently under IBM Maintenance
Equipment Availability: Immediately
For Further Information
Please Write To
Princeton University
P.O. Box 33
Princeton, NJ 08544
Or Call Don Weston
609-452-3407

IBM

4341-K1
1870 Available
$5500 3 Yr. Lease
Purchase Price $183,500
Available Immediately
129-3
$1,000 Ea.
Nominal Feature Charge
$100 Mo./Mo. $75 1 Yr.
$50 2 Yr. Purchase Options
SYSCOMP
(813) 799-4310 Collect

IBM 5110 & 5120
BASIC and APL, 120 CPS
Double Disk Drive
IBM 3742
Contact Mr. Lambergs
(617) 720-1313

For Sale
3420-6's
Dual Density
1x4
(914) 238-9631
COMPUTER MERCHANTS INC.

FOR SALE OR LEASE
3705-E6
w/1301, 1302, 1541, 1642, 4650, 4701, (2) 4714, 9080, 9201, 9311, 9606
CALL PAT
404/998-1001

3340 A2
Short Term Lease/ Sale
3348-70 Available
3370's New ITC
Vargo Companies
313-254-2850

Available for Lease
JULY 3370A1S & B1S
AUGUST 3380A4 & B4
At Net IBM Monthly Lease Charge
Please Call: Jean or Linda
(412)373-8010
CASHFLOW DESIGN INC.

For Sale
IBM System 3 Model 10
5203-001 Printer
5410-A14 Processor
5424-A01 Card Reader
(2) 5444-002 Disk Drives
Douglas Randall Co.
6 Pawcatuck Ave.
Pawcatuck, CT 06379
Contact Neil Jacques
(203)599-1750

IBM S/3 15D
Levitz Furniture Inc.
(3) Systems For Sale by Owner
(2) D26 CPU's 512K
(1) D24 CPU 256K
(3) 3340 100mb Disks
(3) 3344 404mb Disks
(3) 1401 N1 Printers
(1) 3410 and 3411 Tape
CALL: (203)741-2926

Lease or Sell
IBM 4331
MODEL J02
Long or Short Term Lease
Will Replace Your J01 With Our J02
For Little or No Increase.
CALL NOW!!!
DATAMAN
P. O. Box 11288, Knoxville, TN 37919
(615)524-8610

IBM
FOR SALE
3645 001 PRINTERS
NEVER UNBOXED
CONTACT JOE SPEARS
(502)778-3311

For Sale: IBM S/3-12
5412 B-16 CPU
3340-C02 disk storage
5203-003 printer
3741-001 data entry
(2) 3348-070 data module
Asking $8,500
WEB SERVICE, CO.
3690 Freeman Blvd.
Redondo Beach, CA 90278
Peter Lam (213)772-5131

IBM

S/34 RPG II 1/2
Write more programs,
Faster, with fewer bugs.
Call or write today:
BPS Information Services Inc.
Dept. 301, P.O. Box E
Conrad, IA 50621
(515) 366-2976

WANT TO BUY
SYSTEM 34's
ALL MODELS
Hans Bressler
DATA 3 COMPUTER CORP.
(612)941-9495
(800)328-7938

For Sale by Owner:
IBM SYS/3 M-12
5412-32K; 5421-Control
1403-N1; 2-3741-1; 6-3348's
BEST OFFER
Contact:Larry Wells
513-896-2700

FOR SALE
(4) IBM Model 4955E Series/1
With Accessories
(1) To (40) Sycor 350 Intelligent Terminals
Contact: Tom Hoover
PETER KIEWIT SONS', CO.
P.O. Box 31183
Omaha, Nebraska 68131
402-342-2052

FOR SALE SERIES 1 EQUIP.
USED 4952-A & B 128K
USED 4962-4
USED CDC 80420-10 180cps Matrix prtr.
Good selection heavily used software.
No Brokers Please.
LeRoux, Pitts & Assoc., Inc.
300 S. Duncan Ave., Ste. 225B
Clearwater, FL 33515
(813)461-3671

FOR LEASE ONLY
IBM System/34
300 LPM Printer
4 Display Stations
*SHORT LEASE TERM
FLEXIBLE
Call Lynn Reed
DISCOM
(714) 893-6541

SYSTEM 38 MODEL 561
AVAILABLE IMMEDIATELY
For Sale or Lease
Features and Peripherals
Available to your specifications
System 34 Will Be Accepted in Trade
Inquiries invited
FUNDWAYS
(212)494-7407

IBM SYSTEM 34
MODEL E36 with 2500/3701
5225-3, (1) 5251-11
IBM List $86,638
ASKING $64,000
Available July 1,1982
MIDLAND MARKETING CO.
Ron Dahl or Terry Swenson
(612)933-4146

FOR SALE
(1) 3803-2 Tape Control w/1792,8100
(1) 6580-A02 Display writer
(1) 2701-1 w/3815, 3855, 7697, 8029
(1) 3411-003 w/3211,7360, 4331
(4) 3410-003 w/3211
(1) 3276-2 w/3255, 3256, 3257, 3701, 6302, 6315
(1) 3340-A2 (1)3340-B2
Rosellus Computer Corporation
(405)348-6890

FOR SALE OR LEASE
BY OWNER
370/168 MODEL LKJ
(1) 2860-3
(1) 2870-1
(2) 2880-2
Available July, 1982
Attractive Flexible Lease Terms
(NO BROKERS PLEASE)
Reply to CW-A3271
Computerworld
Box 880
Framingham, MA 01701

The Bulletin Board

The Bulletin Board

The Bulletin Board

BASIC FOUR

Basic Four Model 2924 Disks
$35 Each Plus Shipping
(212) 943-3650
Ask for DP Manager

BASIC FOUR 730
160K Lightning Processor
375MB Disk Drives
11 VDT's
2 Printers, 300LPM
42 Disk Packs
Under Maintenance Contract
$35,000
Contact Dave Wahlberg
(213) 728-5100

BUY SELL LEASE
BASIC 4
Systems, Peripherals, or Components
ALETA ENTERPRISES INC.
28 Esplanade, Irvine, CA 92715
Contact Ty McMillin
(714)552-3559

BASIC 4 SYSTEM 2000
LESS THAN ONE YEAR OLD
96KB system memory,10MB disc drive
9.2MB magnetic tape drive, (1) VDT, 1 Multi-function VDT and word processing terminal, 160 CPS printer, Dataword II and system software
INDUSTRIAL COMMUNICATIONS, INC.
1910 Commerce Union Tower
Chattanooga, TN 37450
(615)756-0636

Your ad can be seen here for just $99.

HEWLETT PACKARD

BUY & SELL 1000 & 3000
Systems • Components
WESTERN DATA SALES, INC.
(213)539-8917

(2) HP 7905A DISKS
Newly Refurbished by Hewlett-Packard
Compatible with Either 1000 or 3000 Series
S. D. Slingsby PhD. & Assoc., Inc.
(714)675-8036

HP3000 III 1024KB Memory
Immediate Sale Or Assume Lease
(3) 120MB Disk Drives
1600 BPI Tape and Terminals
400 and 200 LPM Printers
All Software and Modems Included.
Under HP Full Maintenance.
FAR-WEST DATA SYSTEMS
17841 Fitch, Irvine, Ca 92714
(714)556-4585

AVAILABLE IMMEDIATELY
FOR SALE OR LEASE
HUGE INVENTORY OF HP EQUIP.
Complete system, Memory, terminals, disk drives, tape drives, printer controllers, tape controllers, ATC's, ADCC's, memory expansions, etc.
We will accept HP and/or IBM equipment in trade.
Call Us For All Your Equipment Needs.
FUNDWAYS, LTD. (212)494-7407

FOR SALE
(1) HP3000-30
w/disks, printers, & CRT's
Rosellus Computer Corporation
(405)348-8690

TI

TI990/12 Model 36
In Stock for Immediate Sale or Lease to Highest Bidder **one (1) TI990/12 Model 36** with secondary DS300 disk drive and one additional DS300 master kit. All equipment new from the factory, uncrated, with remaining TI warranty. Interested parties may call for additional information or purchase/lease bid.
(314)876-5352

WANG

WANG VS SOFTWARE
FIMOD - Financial Modeling 1 & 2
Warehouse Distribution System
General Ledger Accounting $3,000.00
Accts. Pay or Accts. Rec. $3,000.00
Freight Forward Accounting System
Legal Time Billing System
Payroll/Personnel System
MRP Model Simulation
Fixed Asset Mgmt. System $2,000.00
MDS SOFT PRO SYSTEMS (415)234-5440

For Sale
VS-80
256K, Newly Updated
Contact Eldon Anderson
(800) 635-9402
Or Call Collect
(208) 254-3731

Attention Wang Users For Sale
(20) Used Phoenix Disk Packs
$125 Each
Quantity Discounts Available
Also Available
CDC 80, 90, 300 Disk Drives and Packs For Wang Systems
Call Chris at
(312) 676-1900

BURROUGHS

WANTED TO SELL 1855 SYSTEM
• With 524KB, Multi-line control
• (2) 206 Drives, 750 LPM Printer
WANTED TO BUY
• TD830 CRT's, MT983 CRT's
• All Systems & Peripherals
B1955 Avail. 4th Quarter
Mr. Ross (216) 292-3774

FOR SALE: USED BURROUGHS B1855
w/512K,325 Mb,750lpm Ptr.,40kb tape drive rdr. pnch., Dataproducts 2230 Ptrs., 300lpm.
USED BURROUGHS B1860:w/512K,750lpm Ptr.,580 MB disk,80kb tape drive
USED DISK CARTRIDGES
17 CFI 2315-22 24,(1) Caelus HD-1
BUTTES GAS & OIL CO.
Call Thomas Hopler (800)227-0460
In CA (415)839-1600

PRINTERS

DATAPRODUCTS 2230's PRINTERS
For Immediate Delivery
New/Surplus $3,750
64 Character,300 LPM.
Substantial quantity discounts offered.
CDC Disc Drive Drive
Replacement parts Available
SAGA ENGINEERING CORP.
20935 Nordhoff St., Chatsworth,CA 91311
(213)998-6066

DATAPRODUCTS
Sale - B600
600LPM, New Unit
All other DPC Printers Available New & Refurbed
American Computer Hardware
(714) 549-2688

TERMINALS

Lear Siegler ADM-42's
Like New Condition
Four Available
$1595.00 each or best offer
Call: Steve
(512) 680-4063

TI 765'S
Low Mileage Terminals
For Lease or Purchase
765/20K/TIBOL Option-6
765/40K/TIBOL Option-6
Additional Memory Available
All on Maintenance Now
Contact Mrs. Paget
CTD, Inc.
(216) 464-4482

DATASOUTH DOT MATRIX PRINTER
180 cps
OEM PRICING!!!
Immediate Delivery
MCD CORPORATION
(313)924-1020

DIABLO TERMINALS
ALL MODELS
NEW and/or
DIABLO REFURBISHED
ALL UNITS CARRY
DIABLO 90 WARRANTY
EMERSON
(415) 837-8728

Call 1-800-343-6474 to place your ad

MISC.

Buy-Sell-Lease
STC
Tape & Disk Equipment
NEWPORT DATA CORP.
Call: (714) 752-8005

COMPUTER BROKERS
We Buy, Sell & Broker
All Types & Brands of Computers.
IBM • DEC • DG • TRS-80 • APPLE • Etc.
Call or Write for **FREE LIST** of Bargains
COMPUCHANGE
P. O. Box 4151
Anaheim, CA 92803
(714)535-1990

For Sale or Lease
BTI 5000 COMPUTERS
40% OFF LIST PRICES
Any Configuration
Harold
(415) 858-2800

COMPUTER FLOORS
Used-New
Bought-Sold
Installation
Alteration
Refinishing
Parts and Service
RC PULIS ASSOCIATES,INC.
16 Voorhis Lane
Hackensack,NJ 07601
(201)488-3333 or (212)564-4636

SOFTWARE FOR SALE

PDP-11 & VAX USERS

TRANSACTION PROCESSING

Cytrol's CYX system is the best choice for your complete transaction processing needs. A proven performer, CYX simplifies on-line application development to save time and money. We've removed the obstacles that can trip up smooth transaction processing to guarantee efficient, reliable systems.

Basic CYX extends RSM-11M/VMS to provide:

- Communications Management for 3270 type terminals.
- Screen Management with input editing and data validation.
- A Data Base Management System that delivers improved on-line performance.
- An unrestricted RSX-11M/VMS environment.
- Transaction Roll-Back with full restart/recovery.
- Performance Reporting

And...CYX supports optional software products that expand CYX services to include:

- 3270 Reach Through
- Report Writing
- Security Control
- Mailbox Functions
- Centralized Program Error Reporting
- Text Filing
- Data File Maintenance Functions that eliminate the need to write programs to add, delete or modify records.

All additional applications can be written in any DEC supported language and have access to all RSX-11M/VMS services.

For more information about the CYX Transaction Processing System and how Cytrol can work for you, call or write:

cytrol

4570 WEST 77 ST., EDINA, MINNESOTA 55435 PHONE 612/835-4884

HASP
VAX and PDP-11
high speed communications link to
IBM•CDC•DEC•ETC
REMOTE BATCH, DISTRIBUTED PROCESSING, AUTODIAL, LOW OVERHEAD, NO RISK TRIAL
datanex
Datanex, Inc. P.O. Box 30008
Eugene, Oregon 97403 (503) 687-2520

SELL YOUR SOFTWARE IN THE CLASSIFIED PAGES OF COMPUTERWORLD

CALL 800-343-6474 (or 617-879-0700) FOR MORE INFORMATION

Introducing PYCCO's On-line accounts receivable

a customized solution at half the price of the name brands.

- Available for IBM 360/370/4300 DOS systems using CICS or WESTI
- Easy to use, easy to maintain, and easy to modify
- COBOL based, menu prompted, and table driven
- Also Order Entry, Accounts Payable, and Lease Management

For People You Can Count On call:

PYCCO COMPUTER SYSTEMS INC
710 E. OGDEN AVENUE • SUITE 201 • NAPERVILLE, ILLINOIS 60540

(312) 961-2262

Find any software for any micro, mini, or mainframe. SOFSEARCH outperforms all software directories because it's not a directory. SATISFACTION GUARANTEED.

Call

1-800-531-5955

In Texas, 512-340-8735

SOFSEARCH™
software locator service

The world's first software locator service.

CCS Incorporated P.O. Box 5276 San Antonio, Texas 78201

software for sale | software for sale | software for sale | software for sale | software for sale

Make your IBM System/34 work harder for you.

FactFinder™
Data base information system accesses the computer with simple English commands. Inquiries, reports, graphs.

WordPower™
Advanced full function word processing...from letter writing to documentation. Easy text entry and editing.

EasyPlan™
Easy-to-use, electronic financial planning and modeling system. Produces financial work-sheets, consolidations, projections, "What-if" analyses.

DaisyWriter™
Compatible, high quality, low-cost daisy wheel printer. Interchangeable plastic and metal wheels. More than 100 type styles.

RMS
Complete, integrated set of application software modules for order processing, distribution, production, and financial management.

Information Systems
Design, development and implementation of custom information management systems.

From word processing to financial planning...consulting to programming...PCR has the resources to help you maximize your IBM System/34 productivity.

Professional Computer Resources, Inc.
2021 Midwest Road, Oak Brook, IL 60521
In Illinois call: 312/932-2200
Outside Illinois: 800/323-3331
San Francisco: 415/461-7580
New York: 201/944-9460

pcr professional computer resources

Payroll Systems

Tired of changing your payroll system every year? Have problems paying your employees on time? Need better control over where your labor effort is going? Use PLYCOM's Payroll Package for software that is easy to use, yet effective. Includes complete support and excellent documentation.

Features:
- Easy to use menus
- Completely interactive
- Excellent audit trail
- Divisional & department reporting
- Multi-state tax calculations
- FICA excludable pay type
- Event driven or exception type
- Extensive on-line error checking
- User defined pay cycle
- Easily handles manual checks
- Effective control on voids or returns
- On-line employee inquiry
- Productive labor reporting
- For PDP-11's using RSTS E

Plycom services, inc
P.O. Box 160
Plymouth, IN 46563
(219) 935-5121

SYSTEM/34/38

Para Research offers a different marketing approach for software. We provide the best software packages at lower prices. We do this to obtain volume sales, a larger user base and to encourage user feedback. This approach and the input of our many users have made us what we are today: the world's largest distributor of System/34 software. All packages are completely documented, supported by our hotline staff and our money-back guarantee.

WORD PROCESSING $750
Paratext is the most successful and complete word processing system available for the System/34. There are more than 1,700 Paratext users. Paratext offers full-screen text editor, automatic justification, individual forms design, viewable corrections, heads-down typing, word wraparound, variable data insertion, label printing and math capabilities. Paratext is also available for the System/38 at $1,500.

FINANCIAL MODELING $500
Paracalc is a diversified modeling system that easily calculates budgets, cash flow, sales projections, commissions, return on investment, production forecasts, anything you can set up in rows and columns. Change one entry and all amounts are re-calculated accordingly in up to 24 columns and 400 rows. Consolidation from many models to one. Return on investment. Available on the System/38 for $1,000.

ACCOUNTING SYSTEMS $500
General Ledger, Accounts Payable, Payroll, Fixed Assets Accounting and Accounts Receivable. Whatever your needs in financial applications, Para Research has the answer. All modules support multiple companies, all are interactive and all can be interfaced with existing software.

MAPICS PURCHASING $1,500
MAPICS Purchasing provides complete tracking status for manufacturers using IBM's MAPICS System. It allows input of multiple vendors per item and interacts with MAPICS Accounts Payable, Inventory Management and Materials Requirements Planning modules. Users can produce reports ranging from Purchase Price Variance to Suggested Order Placement to Cash Requirements. MAPICS Purchasing eliminates key entry and typing of purchase orders. This is a must for every MAPICS user.

PARAPLOT GRAPHING $350
Paraplot turns statistical data into easy-to-read bars or points. It creates graphs and charts for almost any business activity. In fact, you can produce graphs over 25 inches high. The system plots on your system/34 character printer and CRTs. No special plotting equipment is required.

DATA SYSTEMS $250 to $600
Documentor, $600, provides complete automated documentation, with up to fifteen individual reports that describe systems and subsystems in each program. Clock, $250, an advance job scheduler, allows your System/34 to be productive 24 hours a day. Rescue, $250, is a procedure re-start program that can also be used to create duplicate programs and procedures.

Easy List, $600, a report program generator, compiles an RPGII report or CRT program from a series of simple English prompts. You no longer need a programmer to create your own meaningful management reports. Time Tracker, $300, allows you to easily and accurately allocate computer costs by department, user, workstation or printer.

PARA RESEARCH

At your request, we will send a complete set of documentation, free of charge. Call or write Software Sales, Dept. CW10, Para Research Inc., Whistlestop Mall, Rockport, MA 01966 (617) 546-3446, Ext. 701.

DATAPOINT APPLICATION SOFTWARE

"DOS and RMS COMPATIBLE"

Over 600 Users in 38 states and Canada
Complete Databus Source Code and Full Warranty On:

Accounts Receivable	Sales Analysis
Accounts Payable	Purchase Analysis
Payroll Processing	Personnel Reporting
Order Processing	Billing (Standard & Progressive)
Inventory Control	Purchase Order Management
Fixed Asset Depreciation	General Ledger
Job Costing with B.O.M. Processing	Check Reconciliation
Distribution	Club Accounting

ALL MSG SOFTWARE INCLUDES:

1 Time Charge - No Royalties
Camera Ready Art Work On All Forms
Complete System & User Documentation
6 Month Warranty

FREE with your order: On screen graphics plotting and bar charting programs w/print capabilities

Write or Call for our free brochure and pricing schedule.

MINI-COMPUTER SUPPORT GROUP, INC.
3645 Warrensville Center Rd. 216-283-2000 Shaker Heights, OH 44122

Financial Planning, General Ledger Reporting System for IBM SYSTEMS 34 & 38
call:
Interactive Program Products Inc
800 Second Avenue
New York, NY 10017
(212) 752-5252
In Chicago (312) 490-1205

NEW SERIES/1 EDX REPORTWRITER+

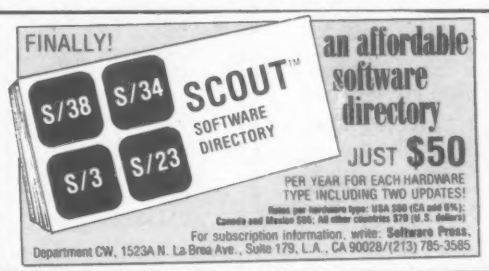
ADVANCE-85

DATA ENTRY/QUERY/REPORTWRITING

CREATE APPLICATIONS LIKE
- Inventory Control
- Financial Reports
- Personnel Profiles
- Sales History
- Mailing Lists
- and more...

With this versatile & friendly menu driven system without writing programs!

i-concepts, inc.
2560 Royal Lane
Dallas, Texas 75229
(214) 243-0700



MINI-COMPUTER SOFTWARE CATALOG OVER 360 PACKAGES IN INVENTORY

Ready to ship...ready to implement
Source...Media...Documentation
The RSI Catalog contains descriptions and prices on all packages in inventory. 1982 edition now available. Send check or money order for $54.95 to:
RESOURCE SOFTWARE INTERNATIONAL
140 Sylvan Ave.
Englewood Cliffs, NJ 07632
(201) 947-6104
Visa and Mastercard orders accepted

Elegant Software

For IBM S/34 & S/38 Computers

General Ledger/Financial Reports
Accounts Payable
Accounts Receivable
Payroll/Personnel
Order Processing
Inventory Management
Mailing Lists
Fixed Assets
Oil & Gas
Job Cost

J. D. Edwards & Company
Two Denver Technological Center
Englewood, CO 80111
303/ 773 3732
Dallas/ 214/ 484 8911
Newport Beach/ 714/ 751 5302

SOFTWARE WANTED

APPLICATIONS SOFTWARE WANTED

Established mfg. firm seeks proven interactive business software to run on VAX/VMS 11/730. May run with either DBMS or traditional. Modules required are: A/R, A/P, G/L, O/E, billing, inventory and sales analysis.

Only well documented software will be considered. We would like to observe other companies in the metropolitan area utilizing your packages.

Send initial contact via mail only to:
J.P. Robinson, V.P.
LPS INDUSTRIES INC
113 N. 13 St. Newark NJ 07101

THE TIME SAVERS

RPG to COBOL
or for those PL/1 Shops
RPG to PL/1

Two of the many **successful** translators offered by Dataware provide a smooth and effortless transition from RPG. The translators can handle most any level of RPG (SYS/3, Mod 20, etc.) and achieve an extremely high percentage of automatic conversion (approaching 100%) of the source code.

For more information please call or write today!

The Conversion Software People
Dataware, Inc.
2565 Elmwood Ave., Buffalo, NY 14217 (716) 876-8722 | TELEX 91519

OUR 44,000 Computer Program Abstracts describe GOOD, AVAILABLE

USED SOFTWARE (THE BEST KIND)

For free 205-Category Index and newsletter, write
National Computer Program Abstract Service, Inc. (NCPAS)
P O Box 3783
Washington, D.C. 20007
703-836-5553

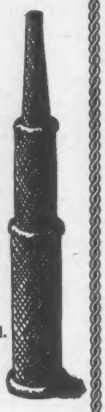
REAL ESTATE

FOR RENT
5,000 SQ. FT.
- Set Up Ideally for Data Computer Processing
- Midst of the Walt Whitman Shopping Center.
- Prime location on Rt.110, Huntington, NY

(516)423-3841 or (516)423-3824

SHOWROOM SPACE
and
COMPUTER ROOM SPACE
in
NEW YORK CITY
specialists in
REAL ESTATE LEASING
for the computer industry
HUBERTH & HUBERTH, Inc.
488 Madison Avenue, New York, NY 10022
212-486-9797
Mel Wallis Julian Mertz

Looking for your own "Computerworld"?



You all know how Columbus and his successors discovered and explored the West Coast, the Sunbelt, the Eastern Seaboard and all points in between, with just their intuition and rough charts to guide them. They did the hard part.

Well, maybe you're another great person looking for your own "New World" in the form of commercial or industrial office space suitable for Data Processing or the computer industry. You're already a step ahead — you've got **COMPUTERWORLD REAL ESTATE** classifieds to guide you.

And if you're looking to sell or lease office space, we can help there, too. Call Al DeMille at **800-343-6474** (In Massachusetts dial (617) **879-0700** or fill out the coupon in the classified section of **Computerworld.**

Real Estate classifieds

Try us - Your ship just might come in . . .

TIME & SERVICES

TIMESHARING AVAILABLE
VAX 11/780-VMS
PDP 11/70-RSTS/E
- FORTRAN, COBOL, BASIC
- DATATRIEVE
- ORACLE ®
- STATISTICAL PACKAGES
- DECNET
- TYMNET ACCESS

CONTACT:
James F. Kelley
INSLAW, Inc.
Washington, D.C.
(202) 828-8800
® trademark of Relational Software, Inc.

SHARE TIME IN MASSACHUSETTS
IBM 4341 - 4 MEG
VMSP/CMS, OS/VS1
EP Communications
Color Graphics, ADRS,
Script/DCF,
PMS, Q-B-E
Call Mark Sands
(617)366-5709

COMPUTER FACILITY CLEANING
Maryland - Virginia - DC
Electronic Environmental Control
Services for Computer Facilities
Features Include:
* Below raised floor cleaning.
* Floor surface & room cleaning.
* Above ceiling cleaning.
* Tailored cleaning frequencies.
* Consulting support for in-house training.
* Free site analysis upon request.
* Utilization of air purification system to .3 microns.
Write or Call:
JOSASLO INC.
P. O. Box 6062, Silver Spring, MD 20906
Tel. (301)340-7533

LOOKING FOR DEVELOPMENT TIME?
NO KILOCORE TICK CHARGES
NO CPU CHARGES
$7 PER HOUR CONNECT TIME
RSTS/E TIME
BASIC PLUS 2
COBOL
BASIC PLUS
PASCAL
C*
} WITH CROSS COMPILER SUPPORT
WORD-4 WORD PROCESSING
WAFE
TECO
EDT
} PROGRAM EDITING
BUDGET BYTES™ 212-944-9230
by Omnicomputer™
1430 Broadway, New York, N.Y. 10018

CURTIS WRIGHT Computer Services
4341-2 370/158-3
VS1-CICS-ROSCOE-DOS
REMOTE JOB ENTRY
CICS DEVELOPMENT
CICS PRODUCTION
CUSTOMIZED SOFTWARE
CONTACT JOE BARRETT
(201) 777-3454
15 MINUTES FROM LINCOLN TUNNEL
ONE PASSAIC STREET
WOOD RIDGE, N.J. 07075

DEPOT
COMPUTER REPAIRS
DEC-NOVA
ALL BOARDS
CPU-MEMORY—I/O ETC.
MEMORIES AND POWER SUPPLIES
ANY MANUFACTURER
DIGITAL DATA SYSTEMS, Inc.
1551 N.W. 65 Ave. Plantation Fl. 33313
305-792-3290
1-800-327-8662
TELEX-232005 ATT DIG

COMPUTER TIME PRIME COMPUTER
PRIME 750
3 MEG
Interactive
Remote Job Entry
Call: Darwin Thorbeck
Thor Data, Inc.
(212) 473-5800

ADVERTISERS' INDEX

Advanced Electronic Design 19
Advanced Systems, Inc. 60
American Tel&Tel./Long Lines 49
Ann Arbor Terminals 102
Applied Digital Data Systems 97
Applied Software 78
Atlantic Data Supply 78
Axios Products, Inc. 76

Bausch & Lomb 26
BDS Computer Corp. 9
John Beall 107
Beehive International 124
B.L. Moyle Associates ID/23
Carl R. Boehme Associates 33
Braegen Corporation ID/23
Burroughs Corporation 54

Cardinal Computer ID/11
Carleton Corporation 13
C & D Batteries 112
CGA 44
Chubb Advanced Training Institute 40
Cincom Systems, Inc. 45,47
Circle Computer 24
CMI 68
Codex Corp. 17
Comdata Corp. 83
ComDesign 76,120
Computer Consultants Consortium 15
Computeristics 74
Computer Products Marketing 24
Computer & Terminal Exchange 89
Computerworld 122-123
Computerworld Extra 50
Computerworld Index 88
Computerworld Mexico 100
Computerworld Office Automation 72
Computerworld Readership 75
Control Concepts 46
Continental Illinois National Bank 110
CS Computer Systems 118
Cullinane Database Systems 30

Dallas Market Center ID/19
Data Decisions ID/24-ID/27
Data General-CS 98-99
Datagraphix 52-53
Data Management 10
Datapoint Corporation ID/4
Datapro 48
Data Systems for Industry 94
Deltak 104
Digital Associates ID/22
Digital Equipment Corp./Accessories & Supplies 87
Digital Equipment Corp./Large Systems Group 25
Digital Equipment Corp./NPM Personal Computers 42-43
Digital Equipment Corp./Software Services 113
Digital Research 84-85
D & O Leasing 104
D.P.Facilities 120
DTSS/Tempo 23
Duquesne Systems 71
Dylon Corp. 31

Eastman Kodak Co. ID/21
EEC Systems 32
Electronic Distribution Processing 8
Evans, Griffith & Hart 76
Execucom Corp. 115

General Electric 116
Geneeyn 82
Graham Magnetics, Inc. 70

H & A Computer Systems 6
Hannagan & Associates 32
Hazeltine Corp. 101
J.P. Hearne & Associates 12
Hewlett Packard General 79
Hewlett Packard Terminals 34-35
Hi-G Incorporated 86

IBM ID/7,ID/8-ID/9
IMSL 12
Infodata Systems, Inc. ID/28
Infoworld ID/10
Integral Systems ID/16
Intelmatique 18
Intertec Data 121
ITT Courier 90
ITT Worldcom 95

J.L. Consulting Services ID/11

The Koffler Group 31

Lear Siegler ID/15
Lee Data Corp. ID/17

Mannesmann Tally 94
Mantissa Corporation ID/18
MCAUTO Computer 108
McCormack & Dodge 36-37
Memorex RMCD 80
Microdata ID/14
Mini/Micro Educational Services ID/22
Monroe Computer Corporation 119
Morino Associates 105,109
MSA 154
MTI Systems Corp. 100
Multi-Tech Systems, Inc. 15

NCA Corporation 73
NCR Corporation 58-59
Nixdorf Computers 117

Oxford Software 33

Panaophic Systems, Inc. 41
Perkin-Elmer 92
Polygon Associates ID/4
Prodata 14
Protocol Computers Inc. 38

Qwikterm 14,49,120

RCA Service 56

SAS Institute, Inc. 22
Selanar ID/12
S & H Computer ID/10
Siggraph '82 81
Signal Technology, Inc. 76,106
Softmatics Corp. ID/20
Software AG 51
Software International 114
Software Systems Tech. 32
Storage Technology Corp. 111
Stratus Computer 77
Syncsort, Inc. 3
Sys-Ed 110

Tandem Computers 69
Technical Analysis Corp. 120
Technology Group-BMC Division 20-21
Telesy Division-Research,Inc. 118
Televideo 96
Telex Computer Products 29
Terminal Brokers/NCC 7,20,27,40
Thomas Computer 39
Three Rivers Computer Co. ID/5
Tone Software 12
Toshiba Corporation 16
Total Assets Protection ID/20
Transnet Corporation 14
Triangle Software 28
TRW-Customer Service Division 27

Unicube ID/12
University Computing Co. 57
University of Minnesota 16

Vertex Systems, Inc. 104

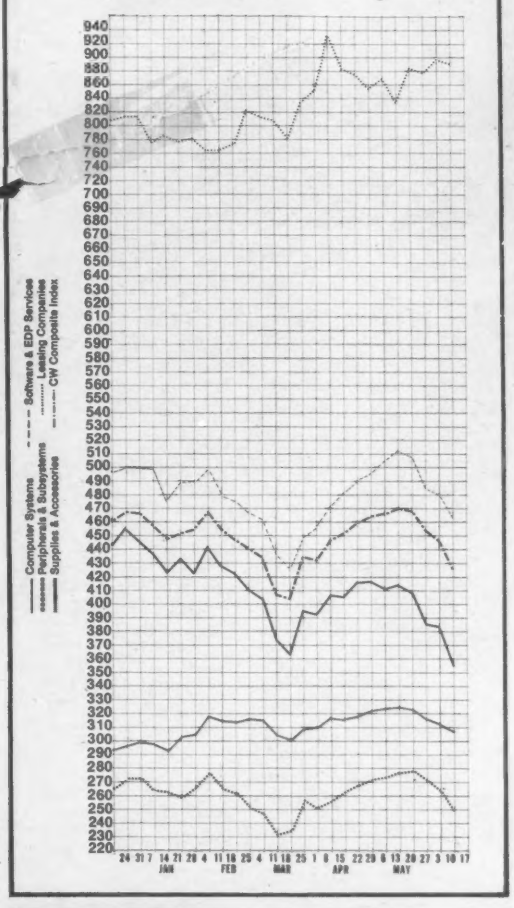
Wabash DataTech, Inc. 91
Wallace Computer Services ID/6
Dean Westover 14

Xerox - Computer Service Division 93

Yourdon 5

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Computerworld Stock Trading Index



Computerworld Sales Offices

Roy Einreinhofer, **Vice-President/Marketing.** Donald E. Fagan, **Vice-President/Sales.** Frank Collins, **Manager, Display Advertising.** William J. Mills, **Manager, Classified Advertising.** Diana La Muraglia, **Manager, International Marketing Services.** COMPUTERWORLD, 375 Cochituate Road, Box 880, Framingham, Mass. 01701, Phone: (617) 879-0700, Telex: 95-1153.

BOSTON SALES OFFICE: Chris Lee, **Northern Regional Manager.** Edward P. Marecki, Joseph Fitzhugh, **District Managers.** Kathy Doyle, Diane Sukey, **Account Coordinators.** COMPUTERWORLD, 375 Cochituate Road, Box 880, Framingham, Mass. 01701, Phone: (617) 879-0700, Telex: 95-1153.

NEW YORK SALES OFFICE: Michael J. Masters, **Eastern Regional Manager.** Peter Senft, Doug Cheney, Ray Corbin, **District Managers.** Fred LoSapio, **Sales Assistant.** COMPUTERWORLD, Paramus Plaza I, 140 Route 17 North, Paramus, N.J. 07652, Phone: (201) 967-1350.

CHICAGO SALES OFFICE: Dave Dolber, Newt Barrett, **District Managers.** Jan Raska, **Account Coordinator.** COMPUTERWORLD, 2600 South River Road, Suite 304, Des Plaines, Ill. 60018, Phone: (312) 827-4433.

LOS ANGELES SALES OFFICE: Jim Richardson, **District Manager.** Bob Hubbard, Delbra Pendergrass, **Account Managers.** Beverly Raus, **Account Coordinator.** Eileen Dunn, **Recruitment Account Manager.** Phone: (415) 421-7330. COMPUTERWORLD, 18008 Skypark Circle, Suite 260, Irvine, Calif. 92714, Phone: (714) 556-6480.

SAN FRANCISCO SALES OFFICE: William J. Healey, **Western Regional Director.** Barry G. Milione, Rick Jamison, **Account Managers.** Ruth Gordon, **Account Coordinator.** Eileen Dunn, **Recruitment Account Manager.** COMPUTERWORLD, 300 Broadway, Suite 20, San Francisco, Calif. 94133, Phone: (415) 421-7330.

JAPAN: Mr. Shohei Kurita, COMPUTERWORLD JAPAN, 1-19-7 Shintomi, Chuo-ku, Tokyo 104, Phone: (03) 551-3882, Telex: 252-4217. Esteban H. Yamada, Tokyo Representative Corp., Yamaguchi Bldg., 2-12 Kanda Jimbo-Cho, Chiyoda-Ku, Tokyo 101, Phone: (03) 230-41178, Telex: J26860. **UNITED KINGDOM:** Richard Hease, ECC Publications, 30-31 Islington Green, London N1, Phone: (01) 359-7481. Euan C. Rose, Robert Hall, BEERE, HOBSON ASSOCIATES, 34 Warwick Rd., Kenilworth, Warwickshire, CV8 1HE, Phone: (0926) 512424, Telex: UK-311951. **WEST GERMANY:** Eckhard Utpadel, CW PUBLIKATIONEN, Friedrichstrasse 31, 8000 Munich 40, Phone: (089) 34-90-61, Telex: W. Ger-5-215350-HKFD. **AUSTRALIA:** Alan Power. COMPUTERWORLD PTY. LTD., 37-43 Alexander Street, Crows Nest, NSW 2065, Phone: (02) 439-5133, Telex: SECCO AA25468. **BRAZIL:** Eric Hippeau, COMPUTERWORLD do BRAZIL, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor, 20031 Rio de Janeiro, RJ, Phone: (021) 240-8225, Telex: 11-32017 (WORD BR). **MEXICO:** Richard Small, COMPUTERWORLD de MEXICO, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F., Phone: (905) 514-4218, (905) 514-6309. **FRANCE:** Patrick Morel, Le Monde Informatique, 42, Avenue Montaigne, 75008 Paris. **SPAIN:** Neil Kelley, COMPUTERWORLD/Espana, Barquillo, 38, Madrid-4. **DENMARK:** Helle Lind Christensen, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone: 01-1234-11.

CW COMMUNICATIONS/INC.

Board Chairman/Publisher
Patrick J. McGovern
President
W. Walter Boyd
Senior Vice-President
Lee Vidmer

Group VP-Communication Services, Jack Edmonston. **Group VP-Circulation,** Margaret Phelan. **VP-Marketing,** Roy Einreinhofer. **VP-Sales,** Donald E. Fagan. **VP-Finance,** William P. Murphy. **VP-Editorial,** John Whitmarsh. **VP-Special Publications,** Robert Ziegel.

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 880, Framingham, MA 01701 Phone: (617) 879-0070, Telex: 95-1153.

SALES — **Vice-President,** Donald E. Fagan. **Display Advertising Manager,** Frank Collins. **Display Advertising,** Tracey Eastman, Anne Hadley, Pam Valentinas, Julie Sullivan. **Classified Advertising Manager,** William J. Mills.

COMMUNICATION SERVICES — **Group Vice-President,** Jack Edmonston. **Director Research,** Kathryn Dinneen. **Sales Promotion Manager,** Noreen Kimball.

CIRCULATION — **Group Vice-President,** Margaret Phelan. **Circulation Manager,** Barbara Jeannetti. **Service Rep,** Peggy Kelly. **Assistant,** Carmela Priante.

PRODUCTION — **Production Director,** Peter Holm. **Production Coordinator,** Marlene Stibal. **Supervisor,** Henry Fling. **Systems Manager,** Tom Pfau. **Typesetting Manager,** Carol Polack. **Art Director,** Tom Monahan.

Computerworld Stock Trading Summary

TRADE QUOTES

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES WEDNESDAY, JUNE 9, 1982

E X C H		1981-82 RANGE (1)	CLOSE JUNE 9 1982	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	19- 46	18 1/8	-1 3/4	-8.3
N	BURROUGHS CORP	28- 72	32 1/2	-2	-5.7
O	COMPUTER AUTOMATION	6- 28	7 1/2	- 3/4	-9.0
N	CONTROL DATA CORP	19- 42	23 1/2	-1 1/4	-5.0
N	CRAY RESEARCH INC	20- 48	20 1/8	-4 1/4	-17.4
N	DATA GENERAL CORP	23- 87	25 7/8	- 3/4	-2.8
N	DATAPOINT CORP	12- 68	12 7/8	-1	-7.2
N	DIGITAL EQUIPMENT	69-113	69 3/8	-5 1/4	-7.0
A	EECO INC	8- 19	9 5/8	-1 1/8	-12.8
N	ELECTRONIC ASSOC.	5- 13	7 3/8	- 3/8	-4.8
N	FLOATING POINT SYST	13- 30	19	-1 7/8	-8.9
N	FOXBORO	33- 62	33 7/8	-2	-5.5
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 18	3 7/8	- 1/2	-11.4
N	HARRIS CORP	24- 60	23 1/2	-2 1/8	-8.2
N	HEWLETT-PACKARD CO	33- 54	40 3/8	-3 1/8	-7.1
N	HONEYWELL INC	63-115	65 7/8	-2	-2.9
N	IBM	48- 73	58 1/8	-3 7/8	-6.2
O	IPL SYSTEMS INC	6- 13	6	- 1/2	-7.6
O	MAGNUSON COMP SYSTS	3- 32	3	- 3/8	-11.1
N	MANAGEMENT ASSIST	9- 26	11 1/8	-1 1/2	-11.8
O	MINI-COMPUTER SYST	0- 4	0 7/8	- 1/8	-16.6
N	MODULAR COMPUTER SYS	7- 32	8 1/8	+ 3/8	+4.8
N	MOHAWK DATA SCI	10- 32	10	-1	-9.0
N	NCR	39- 76	46 5/8	+ 7/8	+1.9
N	PERKIN-ELMER	18- 36	18	-1 3/8	-7.0
N	PRIME COMPUTER INC	17- 49	13	-2 7/8	-13.1
N	SPERRY CORP	23- 65	23	- 5/8	-2.6
O	TANDEM COMPUTERS INC	13- 35	24	-2 1/4	-8.5
N	TEXAS INSTRUMENTS	71-151	77 1/2	-7 1/4	-8.5
A	WANG LABS.	22- 46	22 3/4	-1	-4.2
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	18- 28	22 1/2	-1 1/4	-5.2
N	COMDISCO INC	16- 27	17 7/8	+ 1/2	+2.8
B	COMMERCE GROUP CORP	1- 2	1/2	0	0.0
O	COMPUTER INVSTRS GRP	1- 4	3/8	0	0.0
O	CONTINENTAL INFO SYS	4- 9	8 7/8	+ 1/8	+1.8
N	DPF INC	5- 13	8 1/2	- 1/8	-1.4
O	ITEL	1- 15	3/4	0	0.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 30	23 1/2	-1	-4.0
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 6	1 1/2	+ 1/4	+20.0
O	ADVANCED SYSTEMS INC	10- 15	11 1/4	- 1/2	-4.2
O	ANACOMP INC	10- 19	11 3/8	0	0.0
O	ANALYSTS INTL CORP	3- 14	7	0	0.0
A	APPLIED DATA RES.	13- 25	18 3/4	-2 3/8	-11.2
O	ASK COMPUTER SYSTEMS	11- 17	15	0	0.0
B	ASTRADYNE COMP IND	2- 5	1 5/8	- 1/8	-7.1
N	AUTOMATIC DATA PROC	22- 32	23 7/8	-1 1/8	-4.5
O	CGA COMPUTER ASSOC	4- 25	5 3/4	- 1/4	-4.1
O	COMPUTER ASSOC INT'L	12- 20	17 1/4	-1 3/4	-9.2
O	COMPUTER HORIZONS	1- 5	1 3/4	0	0.0
O	COMPUTER NETWORK	4- 9	6 3/8	- 3/4	-10.5
N	COMPUTER SCIENCES	11- 30	11 3/4	- 1/2	-4.0
O	COMPUTER TASK GROUP	10- 23	10 1/2	-1 1/4	-10.6
O	COMPUTER USAGE	2- 10	2 1/4	- 1/8	-5.2
O	COMSERV CORP	9- 16	13	- 1/2	-3.7
O	COMSHARE	5- 21	5 5/8	0	0.0
N	CULLINANE DATABASE	15- 37	28 1/2	-2	-6.5
O	DATA DIMENSIONS INC	0- 4	1/4	0	0.0
O	DATATAB	1- 4	3/4	-	-7.7
O	DSI CORP	4- 9	8 1/4	+ 1/8	+2.0
O	DYATRON CORP	2- 11	2 7/8	- 1/8	-4.1
N	ELECTRONIC DATA SYST	15- 30	27 1/8	- 7/8	-3.1
O	INFORMATICS INC	10- 23	13 7/8	-4 1/8	-22.9
O	INSYTE CORP	1- 3	2 3/4	0	0.0
O	IPS COMPUTER MARKET.	1- 4	1 1/4	0	0.0
O	KEANE ASSOCIATES	4- 8	4 1/4	- 1/4	-5.5
A	LOGICON	12- 38	12 5/8	- 3/8	-2.8
O	MNGT SCI AMER INC	17- 26	20 3/8	- 3/8	-1.7
O	MATHEMATICA INC	12- 26	14 1/2	- 1/2	-3.3
O	MATHEMATICAL APP GRP	14- 28	18	+ 1/2	+2.8
O	NATIONAL DATA CORP	14- 28	18 7/8	- 3/8	-2.1
O	PANSOPHIC SYSTEMS	8- 15	11	- 1/4	-2.2
N	PLANNING RESEARCH	5- 13	6 3/4	0	0.0
O	PROGRAMMING & SYS	1- 2	1 3/8	0	0.0
O	REYNOLDS & REYNOLD	16- 26	20 1/4	- 3/4	-3.5
O	SEI CORP	17- 28	24	- 1/2	-2.0
O	SHARED MEDICAL SYST	26- 37	28 1/2	- 7/8	-2.9
O	STSC INC	6- 28	9 5/8	- 1/8	-1.2
O	SCIENTIFIC COMPUTERS	6- 16	6 7/8	- 1/8	-1.7
O	SOFTWARE AG	7- 23	7 1/4	-1 1/2	-17.1
N	TYMSHARE INC	16- 58	17 3/8	- 1/8	-0.7
A	URS CORP	11- 18	11 7/8	- 7/8	-6.8
N	WYLY CORP	7- 20	8 5/8	- 3/8	-4.1
	PERIPHERALS & SUBSYSTEMS				
N	AM INTERNATIONAL	1- 15	1 1/8	- 1/8	-10.0
A	ANDERSON JACOBSON	9- 26	8	-1 1/4	-12.1
O	AUTO-TROL TECHNOLOGY	8- 62	11 1/8	- 3/8	-3.2
O	BANCTEC INC	10- 25	9 3/4	-1 1/4	-11.3
O	BEEHIVE INT'L	6- 18	6 7/8	- 3/8	-5.1
A	BOLT,BERANEK & NEW	9- 25	17	-1 1/4	-6.8
O	CAMBEX CORP	2- 8	2 5/8	- 1/4	-8.6
N	CENTRONICS DATA COMP	7- 20	9 1/2	- 1/8	-1.2
A	CETEC CORP	4- 8	4 1/8	- 1/8	-2.9
O	COGNITRONICS	2- 11	3 3/8	- 3/8	-10.0
O	COMPUTER COMMUN.	1- 2	1/2	0	0.0
A	COMPUTER CONSOLES	18- 28	21 7/8	- 1/8	-0.5
O	COMPUTER DEVICES INC	4- 10	6 3/4	- 5/8	-8.4
O	COMPUTER TRANSCEIVER	3- 9	5 1/4	- 3/8	-6.8
N	COMPUTERVISION CORP	20- 48	28 3/8	-2 1/8	-7.4
N	CONRAC CORP	17- 28	23 3/8	0	0.0
A	DATA ACCESS SYSTEMS	2- 13	2 3/4	0	0.0
A	DATAPRODUCTS CORP	17- 44	17 1/8	-1 3/4	-9.2
O	DATARAM CORP	4- 15	7 3/8	- 1/8	-1.6
O	DATUM INC	2- 5	2 1/8	0	0.0
O	DAVID JAMISON CARLYL	3- 7	3 1/2	0	0.0
O	DECISION DATA COMPUT	3- 6	4 3/8	- 1/8	-2.7
O	DELTA DATA SYSTEMS	2- 4	1 1/2	- 3/8	-20.0
N	ELECTRONIC M & M	3- 9	3 3/4	- 1/4	-8.2
O	EVANS & SUTHERLAND	18- 40	23 1/4	- 3/4	-3.1
N	GEN'L DATA COMM IND	7- 19	9 3/8	- 1/2	-5.8
O	GENERAL TERMINAL CP	0- 4	3/8	0	0.0
O	GREAT SOUTHWEST IND	1- 12	4 3/4	- 1/2	-9.5
N	HAZELTINE CORP	18- 35	24 3/4	-3 1/8	-11.2
O	INFORMATION INTL INC	8- 17	11	-1	-8.3
O	INTEL CORP	21- 51	28 1/4	-1 1/2	-5.0
O	IPL SYSTEMS INC	5- 15	8	- 1/2	-7.6
A	LUNDY ELECTRONICS	7- 18	9 7/8	+ 1/2	+5.3
A	MSI DATA CORP	11- 27	17 1/2	- 1/8	-0.7
O	NETWORK SYSTEMS CORP	14- 25	18 1/4	-1 1/4	-6.4
O	OMEX	3- 8	3 1/2	0	0.0
N	PARADYNE CORP	25- 52	31 1/8	-2 1/2	-7.4
A	PENRIL CORP	7- 17	7 1/2	- 5/8	-7.8
O	RANTEK CORP	9- 23	17 1/4	-1	-5.4
N	RECOGNITION EQUIP	4- 21	4 1/4	- 3/8	-8.1
O	SCAN DATA	1- 5	1 1/4	+ 1/8	+11.1
N	STORAGE TECHNOLOGY	18- 40	21 5/8	-1 1/2	-6.4
O	SYKES DATATRONICS	8- 34	13 3/4	- 1/2	-3.5
A	T BAR INC	10- 18	9 1/2	-4 3/8	-31.5
A	TEC INC	4- 11	8 1/2	+ 1/8	+1.4
N	TEKTRONIX INC	42- 70	49 3/4	-3 1/4	-6.1
N	TELEX	5- 10	7 5/8	- 5/8	-7.5
O	TESDATA SYSTEMS CP	4- 17	4	- 3/8	-8.5
A	TIMEPLEX INC	7- 18	8	- 1/2	-5.2
O	VISUAL TECHNOLOGY	10- 15	10 1/4	-1	-8.8
O	WILTEK INC	1- 3	1 1/4	- 1/4	-16.8
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	11- 17	12 7/8	+ 1/4	+1.9
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
N	BARRY WRIGHT	15- 24	15 3/4	- 1/4	-1.5
O	CYBERMATICS INC	1- 2	1	0	0.0
A	DUPLEX PRODUCTS INC	12- 17	14 3/4	- 3/8	-2.4
N	ENNIS BUS. FORMS	15- 23	18 3/8	- 1/4	-1.3
N	3M COMPANY	48- 85	49 7/8	-1 1/8	-2.2
O	MOORE CORP LTD	27- 38	28	- 1/8	-0.4
N	NASHUA CORP	15- 33	15	- 1/2	-3.2
O	STANDARD REGISTER	30- 43	39	-1	-2.5
A	TAB PRODUCTS CO	14- 30	14 1/4	- 1/4	-1.7
N	WALLACE BUS FORMS	22- 38	28 1/2	- 3/8	-1.2

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; B=BOSTON L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

"At MSA, packaged software is a service business"

—*John Imlay, Chairman MSA*

John Imlay and MSA Customer Support Team specialists Betty Feezor, Larry Smart, and Pat Tinley.

"That's more than a corporate policy at MSA. It's something we all believe in. From top management on down."

John Imlay believes in service. In the past decade, MSA has grown to become the acknowledged leader in the independent software industry.

The key? *Total software support for MSA customers.*

Here's what this can mean to you.

Get advice from the experts

One of the best reasons to choose software from MSA is the team behind our systems. Your Customer Support Team includes software professionals who have specialized knowledge of different types of business and the operational requirements of different industries, including MRP II.

Led by an MSA Account Manager, these people help plan your new system and work with you on a detailed implementation schedule.

They help get your system up and running. On schedule. Working smoothly.

The team behind the team

Backing up your Customer Support Team are hundreds of other MSA people who work behind the scenes. Development, for example, is a high priority. In 1981 alone, we spent more than $17 million to enhance and improve our application packages. This investment exceeds the total revenues of many of our key competitors.

Look for more than just software

With more than 7400 of our systems installed around the world, MSA software is user-proven and highly refined. But we don't stop there. We support every MSA software installation with the most extensive customer support organization in the industry.

Software For Microcomputers, Too

MSA's Peachtree Software division now offers a full line of business application and word processing systems for most popular microcomputers which use the CPM™ operating system, including the Apple II.™

And our systems are also available from IBM for the IBM Personal Computer.

For details call the Peachtree Software™ Product Center (404) 266-0673.

We follow up

Software maintenance costs can amount to more than fifty percent of your data processing budget. But your MSA application package includes a full year of support services *at no charge.* (After that, you can, like most of our customers, take advantage of our on-going support option.)

As part of our customer support program, we keep track of changes in government regulations, accounting procedures, and technological advances in the data processing industry. And we respond with timely enhancements and releases for your system.

MSA Ready-To-Install Applications Software
1 Accounts Receivable
2 Accounts Payable and Purchase Order Control
3 General Ledger
4 Encumbrance Accounting
5 Forecasting & Modeling
6 Fixed Assets Accounting
7 Inventory and Purchasing System
8 Payroll
9 Personnel Management & Reporting
10 ALLTAX™ Taxing System
11 ALLTAX™ Reporter
—PLUS—
12 Manufacturing Control Systems (MRP II)
13 Complete line of Microcomputer accounting software systems
14 Complete line of Microcomputer word processing software systems

Write or call

For more information on MSA software systems (or software for microcomputers from our Peachtree Division), please write us on your company letterhead. Or call Robert Carpenter at (404) 262-2376. And be sure to include information about your company's computer so that we can send you the right information.

MSA

The Software Company

Management Science America, Inc.
3445 Peachtree Road, N.E.
Atlanta, Georgia 30326